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THE  
BOTANY  
AND GEOLOGY  
OF  
MALVERN

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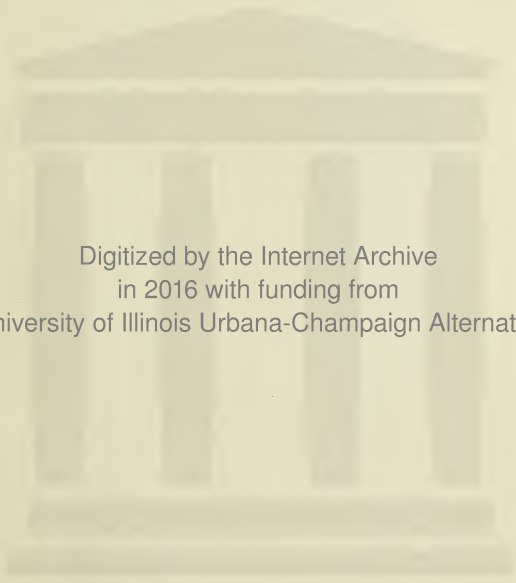
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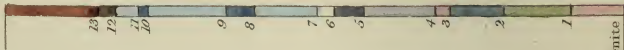
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THE  
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MALVERN HILLS.

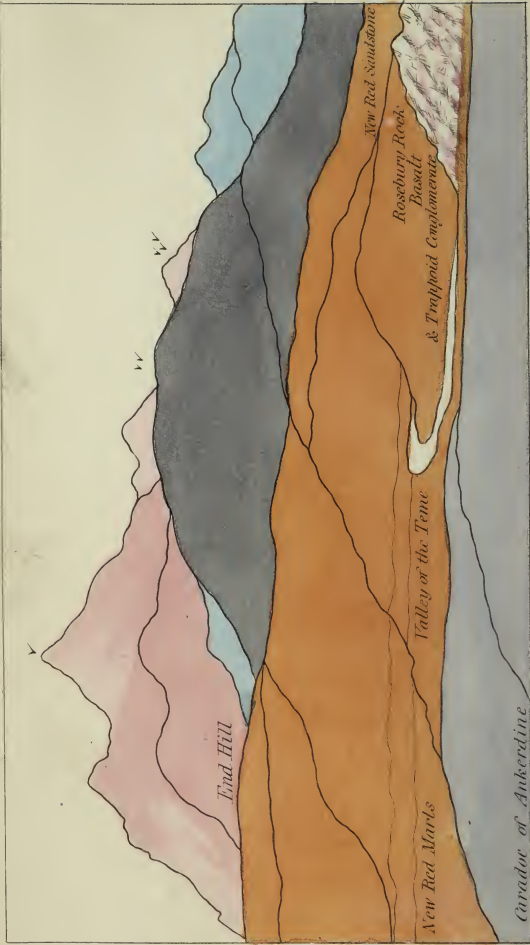
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Syenite  
Vertical Section



Worcestershire Beacon V Old Storage W Herefordshire Beacon

# THE MALVERN SYENITIC AXIAL CHAIN.

In connection with the SILURIAN AND NEW RED SANDSTONE STRATA.  
from Ankerdine Hill.



Mesozoic Strata

Syenite

1

2

3

4

5

6

7

8

9

10

11

12

13

Palaeozoic

Strata

Syenite

Mesozoic

Strata

Transverse Section of the Malvern Range.

THE  
BOTANY  
OF THE  
MALVERN HILLS

IN THE COUNTIES OF

WORCESTER, HEREFORD, AND GLOUCESTER;

WITH A SUCCINCT ACCOUNT OF THEIR

GEOLOGY,

PHYSICAL GEOGRAPHY, CLIMATE, &c.

THE PRECISE STATIONS OF THE RARER PLANTS, AND  
THE MOST INTERESTING LOCALITIES.

By EDWIN LEES, F.L.S.

FELLOW OF THE BOTANICAL SOCIETY OF EDINBURGH; HONORARY MEMBER OF THE  
CHELTENHAM LITERARY AND PHILOSOPHICAL INSTITUTION, ETC.; AUTHOR  
OF "THE BOTANICAL LOOKER-OUT IN ENGLAND AND WALES."

*Second Edition, enlarged and corrected.*

"I have known the herbs of the hills. I seized their fair heads on high, as they  
waved by their secret streams."

OSSIAN.

LONDON:  
DAVID BOGUE, FLEET STREET.  
H. LAMB AND SON, MALVERN.

“ To the purple-tinted mountains of Malvern every one who has a feeling for the picturesque and beautiful will resort ; and how much is the delight experienced by the wanderer on those health-restoring hills enhanced, if he carry with him a taste for botanical pursuits, for that celebrated chain of hills is rich in phænogamous as well as cryptogamous plants !”—SIR CHARLES HASTINGS, M.D.,  
—*Inaugural Address to the Worcestershire Natural History Society.*

“ There he arriving, round about doth fly  
From bed to bed, from one to other border,  
And takes survey with curious busy eye  
Of every flower and herb there set in order :  
Now this, now that, he tasteth tenderly,  
Yet none of them he rudely doth disorder ;  
Ne with his feet their silken leaves deface,  
But pastures on the pleasures of each place.”

SPENSER.



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## P R E F A C E.



THE utility of local Floras is indisputable, not merely as a companion to the wandering Botanist, but as data for the scientific generalizer; and it is almost marvellous that, visited as the Malvern Hills are from all parts of the world, no complete account of their vegetable productions has ever yet been published. But then no sojourner for a month or two could accomplish this task satisfactorily; for although the present work is scarcely more than a catalogue, it has taken the labour of years to survey and resurvey the ground minutely, and a multitude of studious hours have been spent in determining the less obvious and dubious plants. I think, therefore, I may safely say, that there is no mistake in the *Phanerogamous Productions*, most of which have again and again passed under my review, and I have excluded no species that truly belong to the indigenous Flora of the hills. It is true that I have admitted a few *Agrarians*, but these are perhaps as old as the introduction of corn, and therefore not undeserving attention. All the plants are to be understood as having been *gathered by myself*, except in the few instances where I rely upon the authority of friends who have sent me specimens.

The *Cryptogamic Productions* of the hills are so varied and curious, that I have taken especial note of them; and I much regret that the limits necessarily assigned to the present publication have precluded my entering into fuller details respecting them.

In the present edition a succinct account is given of the Geology of the hills, which may be useful to the explorer who has not access to the large and expensive works of Sir R. Murchison and Professor Phillips; and even the botanist may be

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aided in his rambles by fully understanding the nature of the ground on which he treads.

I have distributed the plants in the three grand Natural Divisions, but subdivided them on the *Linnaean plan*, for convenience' sake to the memory, and to avoid the necessity of an index. I have not thought it necessary, as is usually done, to append the authority for the name after each plant, as I have in general taken Sir W. J. Hooker's *British Flora* as my text-book; and therefore, as that work is in the hands of all collecting botanists, of course every species may be there referred to under its recognised designation.

In the former edition I had to acknowledge the kind aid of my eminent and esteemed friend Dr. Addison, F.R.S.; who has now left Malvern; and various habitats were obligingly communicated to me by Miss H. Moseley, John Walcot, Esq. of Worcester, and Mr. Abraham Edmunds, also late of that city.

In the present corrected and enlarged edition, Miss Moseley, well known to many botanists for her matchless collection of original drawings of British Plants, has laid me under fresh obligations; and the following botanists have most kindly communicated all the information their personal opportunities afforded, and I trust they will permit me thus to acknowledge their friendly aid:—the Rev. Canon Cradock, rector of Tedstone; the Rev. J. H. Thompson, of St. Nicholas, Worcester; Mr. Thomas Baxter, second master of the College School; and Mr. Thomas Westcombe. Mr. G. Reece, also, of the Worcester Museum, favoured me with the localities of such plants in that collection as were within my district.

E. L.

*Cedar Terrace, Henwick, Worcester,  
August 1852.*

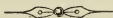
# Observations

ON THE

PHYSICAL GEOGRAPHY, GEOLOGY, CLIMATE, &c.

OF THE

## MALVERN HILLS.



“Where Malvern, king of hills, fair Severn overlooks,  
And how the fertile fields of Hereford do lie.”

MICHAEL DRAYTON.

### SECTION I.

#### PHYSICAL GEOGRAPHY AND GEOLOGY.

PLAIN OF WORCESTERSHIRE AND VALLEY OF THE SEVERN.—  
Worcestershire presents, in general terms, the appearance of a wide plain, intersected throughout from north to south by the Severn. The river-banks at several places, especially between Holt and Tewkesbury, exhibit high shingle-accumulations or beaches, at various distances from the present bed of the stream: these are made up of masses of sand and drift pebbles composed of a great variety of rocks, igneous and sedimentary; and, among the finer beds of sand, fragments of marine shells, such as now frequent our coasts, have been and still are to be found.\* The inference from this, in connexion with the fact of shingle-beds having been traced into Shropshire and Cheshire, is, that not only the estuary of the Severn was in ancient times evidently wider and extended higher up the country than at present, but that, within a com-

\* Some of these, collected at Kemsey by Jabez Allies, Esq., are preserved in the museum of the Natural History Society at Worcester; and numerous similar broken shells have been found by myself and my friend Professor Buckman in the sand-quarry at Northwick.

paratively modern geological epoch, "a strait absolutely connected the Bristol Channel with the Irish Sea; and so fully has this been recognised by the author of the *Silurian System* (Sir Roderick Impey Murchison), as to induce him to name the line of connexion the STRAITS OF MALVERN."\*

As Professor Phillips has remarked in the *Memoirs of the Geological Survey of Great Britain*, to which I shall frequently refer, there is a line strongly traced by nature connecting the estuary of the Dee with that of the Severn, which coincides with the physical, and almost with the old political line of separation between Wales and England. On the west of this line the whole region is mountainous, composed of the older marine strata, mixed with various coeval rocks, the effects of local igneous action; on the east of it extend immense breadths of less ancient deposits, pierced at a few detached points by similar rocks to those that spread more widely to the westward. The country on the west belongs generally to the *Palæozoic*, that on the east to the *Mesozoic* ages of geology.

Thus, on this view of the former aspect of the region overlooked by the Malvern Hills, Wales was an island separated from England by a marine strait that has since become converted into dry land; but an intervening "estuarine period" occurred, when the tidal waters extended far higher up the country than at present, scooping out the eminences against which they washed, and forming little quiet bays, which are now lovely dingles, as may be well observed in the picturesque Habberley Valley, near Kidderminster, and the valley of the Laughern brook, with its high terrace-banks, near Worcester. At Lincomb, two miles below Stourport, large and deep erosions, evidently made by watery action, occur in the face of the sandstone, at a height of fifty feet from the present bed of the river.

Traces of this condition of the country still remain in the marine vegetation that yet lingers in the Severn valley, far beyond the present action of the tides. The Longdon Marshes were doubtless once conjoined to the Severn estuary, and here the *Scirpus maritimus* now flourishes; while at Sarn Hill, near Tewkesbury, and Swain's Bank, near Powick, the *Iris foetidissima*, which is a plant quite attached to littoral places, grows in profusion; and *Erodium maritimum* and *Rumex maritimus* have been gathered within the last few years close to Great Malvern. *Cen-anthe pimpinelloides*, another coast plant, also grows in great abundance in meadows at Powick and Maddresfield, on the margin probably of a

\* *The Ancient Straits of Malvern*, by Professor Buckman.

great backwater extending in this direction ; and *Æ. Lachenalii*, another salt-water plant, inhabits the Welland and Longdon marshes.

**GEOGRAPHICAL POSITION OF THE CHAIN.**—The Malvern Hills may be said to form a great backbone to the counties of Worcester and Hereford, between which they form an undulating narrow ridge, rather exceeding nine miles in length, and running nearly due north and south, but inclining in their course to the south-west. Some of the crests of the ridge rise in bold conical points, giving it a picturesque and mountainous character, though the average height of the chain above the sea is only about 1000 feet, and the highest point of the Worcestershire Beacon does not exceed 1500 feet. According to a very accurately-taken barometrical observation made by William Addison, Esq., F.L.S., late of Great Malvern, the Worcestershire Beacon, which is set down in the Ordnance Survey at the precise altitude of 1444 feet, is only 923 feet above the Library at Great Malvern ; the slope at the base of the hills being thus shown to be full 520 feet above the level of the Severn. The height of the Herefordshire Beacon is 1370 feet, according to a barometrical observation made on the same day on both Beacons by myself, some years since.\* These eminences lie in about 52 degrees of north latitude, and 115 miles N.W. of London, or three degrees of longitude west from the meridian of Greenwich. The boundary-line between the counties of Worcester and Hereford passes in many places along the summit of the ridge, though the parish of Mathon, in Worcestershire, crosses over to the western side, dovetailing with Colwall on the south, and Cradley on the north. At the southern end of the chain, the parish of Bromsberrow, in Gloucestershire, comes in contact both with Worcestershire and Herefordshire. The northern extremity of the chain is about seven and a half miles south-west of the city of Worcester, and the southern nine miles N.N.W. of Gloucester Hereford lies twenty miles west of the central part of the range.

“Within this narrow elongated area,” observes Professor Phillips, “the ridge swells into about twenty distinct summits, disposed in one or two longitudinal rows, and leaving between them hollows of sufficient depth to allow of steep roads and paths across the mountain. Six of these passes, deeper than the rest,—viz. at the Wych,† between Great Mal-

\* At the same time I put down the North Hill at 1342 feet, and the End Hill 1080. Professor Phillips has given 1162 feet as the approximate elevation of the Herefordshire Beacon, which must be too low ; the North Hill, 1366 feet ; Sugar-loaf Hill, 1169 ; St. Ann’s Well, 815 ; and Holy Well, 740 feet.

† Probably derived from the Saxon *wic*, a bend or winding, here applied to the sinuous ascent up the hill.



vern and Malvern Wells; above Little Malvern; between the Herefordshire Beacon and Swinyard (or the Warren) Hill; between Swinyard Hill and Midsummer Hill; between Midsummer Hill and Raggedstone Hill (through which the turnpike-road from Tewkesbury to Ledbury passes); and between Raggedstone Hill and Keysend Hill (where the White-leaved Oak valley and hamlet occur),—allow of roads across from east to west; while at each end of the ridge other roads in the same direction serve to complete the connexion of the vales of Herefordshire and Worcestershire which the Malvern Hills naturally interrupt."

In the transverse valleys that perforate the hills the most craggy aspect of the chain might be expected to present itself; but this is scarcely the case, as the gradual slope of the hills even in these passes, from the friable nature and rottenness of the rocks, prevents that stern rigidity of feature which would be evident with less disintegrating materials. The pass of the Ledbury road, however, between Little Malvern and "the Winds' Point," exhibits a fine view of the Herefordshire Beacon. Besides these valleys that break entirely through the chain, numerous ravines stretch up the sides of the hills, exposing many bare masses of rock, especially in what is called "the Winding Valley," between the Worcestershire Beacon and the North Hill, and the Stony Glen, between the North and End Hills. These are some of the best stations to find plants upon the hills. The only lateral valley between two parallel spurs of the chain occurs at the smaller camp, south of the Herefordshire Beacon, where the westernmost height, called Midsummer Hill, forms the highest ground of the fortification; the eastern height, which is included in the entrenchment, is called Hollybush Hill. This is a good locality for cryptogamous plants.

The range rises higher and higher towards the north, till near the extremity; but, in fact, two grand portions of the Malvern Hills may be well distinguished, separated by the transverse pass of Winds' Point, above Little Malvern; each of which, as remarked by Phillips, "rises and grows broader toward the north, the southern portion being crowned at the northern extremity by the mounds of the Herefordshire Beacon, and the northern portion rising in the Worcestershire Beacon to the height of 1444 feet." Swinyard Hill curves round considerably to the west, leaving an elevated plateau at the "Silurian Pass;" and the Hollybush, Raggedstone, and Keysend Hills, appear to form a third division southwards.

On the eastern side the hills rise at a considerable angle from a gently undulating plain, varied with islet-like eminences of red marl,

that stretches to the banks of the Severn, at distances varying from three to six miles. On the western side the ascent is more gradual, and the country for several miles in that direction is formed of a succession of minor hills and ridges, densely covered with coppice-wood. The longitudinal bearing of these heights is in general parallel to that of the chain, but opposite the Herefordshire Beacon they take a wider range, and in irregular flexures approach the town of Ledbury, five miles from the Wyche.

Phillips remarks that the broad surfaces that form the base of the hills, now concealed in moss and grass, and inclined from twenty-five to thirty degrees, "are formed of detritus which has accumulated at this *angle of rest*, and become overgrown with vegetation; the smooth valleys are filled in like manner with such detritus, which is very unequal in depth, and when dug through, shows irregular points and ridges of rock buried beneath the rubbish. This great accumulation of loosened matter is favoured by the facile decomposition and remarkably fissured state of the rocks of the Malvern Hills; it is most abundant on the eastern side, where the greatest difference of level appears between the plain and the mountain-tops, and on that side the detritus may be traced for several miles into the plain."\* The detritus referred to is very sparingly scattered on the western side of the hills, but is so abundantly spread eastward for miles parallel with the range, that wherever the ground is upturned, quantities of angular fragments of syenite appear, so that in many places actual gravel-pits are kept in constant work to convey away the materials for road-making, &c. No causes now in action could convey the fragmentary relics of the hills so far away; and it seems difficult to account for their present location, unless the Malvern range was formerly much loftier than it now appears. If that was ever the case, there might be a glacis from the heights to the present position of the *débris*; or torrents of water would, from higher ravines, sweep down into the plains below with a far greater impetus than the minor rills that now scarcely murmur along the declivities; and thus these syenitic gravel-beds would be accumulated. Bakewell, in his *Geology*, though without any reference to the phenomenon here mentioned, thinks it probable that the Malvern ridge has sustained a diminution of its original altitude. Professor Phillips is of the same opinion; but, calculating the area of the hills and the extent of the broken detritus, he estimates the loss on the summits as only amounting to

\* Phillips—*The Malvern Hills compared with the Palæozoic Districts of Aberley, &c.*

about sixteen feet, and assumes, therefore, "that the waste of the surface of the Malvern Hills cannot have greatly affected their form or elevation *since the present general configuration of the land around it.*"

The irregular hills and valleys on the western side of the Malvern axial chain take off from its apparent elevation when viewed from that direction, though giving rise to much picturesque effect and variations of light and shade; but from the seemingly flat vale of Severn the range rises with sudden and abrupt grandeur, like a mountain boundary, in waving continuity, finely terminating the western horizon,—as Dyer has well expressed it in his poem of the "Fleece," "solemnly vast." The writer of the old Malvern ballad may then be well excused in magnifying his favourite eminence in the popular language he conceived it to deserve:—

"Turn up thine eyes on high,  
There fairly standynge  
See Malvern's highest hill,  
All hills commandynge;  
They all confesse at wille  
Their soveraigne Malvern hille;  
Let it be mightye stille,  
O prayse the Lord!"

There can scarcely be exhibited a greater contrast than is presented by the views of the eastern and western sides of the hills. Eastward, an almost level plain presents a panorama to the eye, of groves, fields, and heaths, extending far as the bounds of vision, studded with towns, villages, churches, mansions, &c., all obvious to the sight, and intersected here and there by the silvery windings of the Severn, traceable at intervals from Worcester to Gloucester, the öolite of Bredon and the Cotswolds, with the distant ridge of Edge Hill in Warwickshire belting the wide-extended scene. On the other hand, the western view shows a confused succession of hills feathered with wood, isolated from each other, with deep intersecting glens and valleys, other hog's-back ridges rising farther on, and intercepting the view or shadowing o'er the scene, till the sullen Black Mountains of Brecknock and the dark hills of Radnor Forest shut in a scene in this direction too often enveloped in mist and obscurity. But in a calm summer evening the eye wanders with delight over the orchards and woodlands of Herefordshire to the far horizon of the Cambrian mountains, where may be distinguished the Peaks of the Berwyns, the Vans of Brecon, Talgarth Beacon, the Sugar Loaf near Abergavenny, the Skyridd Vawr, and the steeps of the Blorengé; still farther southward, the Great Doward on the Wye, the heights of the forest of Dean, and May Hill, appear in



view; while beyond a shining expanse of the Severn estuary, the dim hills of Mendip bound the extensive scene. In the northern horizon, the Abberley range stands prominent, beyond which the Stieperstones, Clee Hills, and Caer Caradoc stand as silent craggy sentinels, and the dome of the Wrekin is very conspicuous. To the north-east the hills of Staffordshire, half-concealed in the smoke of Bilston and Dudley, combine with the Clent Hills and the Lickey to form an undulating outline that joins the high grounds beyond the plain of Worcestershire, the isolated mound of Bardon Hill in Leicestershire being the farthest point visible in this direction.

**GEOLOGICAL CHARACTER OF THE HILLS.**—In geological language, these hills form an eruptive or igneous axial ridge, raised subsequently to the Silurian limestone strata, which is in contact with them in contorted or almost vertical position westward; while, on the eastern side, the new red sandstone flanks the chain, generally, however, with an interposing conglomerate rock, made up of angular fragments of trap, syenite, &c., as if, after the consolidation of the hills, an eruptive line still continued along their bases while the new red sandstone was in process of deposition. Masses of this conglomerate are often found with an aspect as if subjected to a baking process, and made up of undeniable fragments of Malvern rock, yet of fifty different specimens, soldered to each other. This is commonly called “mother rock.”\* At two or three places these conglomerates appear in inclined positions, at some height above the plain; and a mass of sandstone is in contact with the hill at Great Malvern, as if, subsequent to the deposition of the red sandstone, a convulsion had taken place, elevating the hills *en masse*, and rending the sandstone and marly masses, so as to leave many isolated fortress-like hills of the latter detached in various parts of the plain. The Berrow hill, about three miles eastward of the southern portion of the chain, is capped with *lias*, which shows that a later “denudation” must have altered the features of the country to a great extent.

\* Described as “brecciated rocks” by Phillips, who considers them “as slightly displaced portions of the adjoining masses, crushed *in situ* by the force which displaced and broke the chain,” and recompactied again in rather firm aggregates. Mr. Strickland, in his paper “On the Elevatory Forces which raised the Malvern Hills,” considers this plutonic ridge to have been “forced up from below in a solid state,” on a line of fracture amounting to 14,000 feet between the two sides of the “Great Fault;” the syenite being raised into a lofty cliff above the downcast area now buried under the new red sandstone. This amount of dislocation is “greater, perhaps, than can be paralleled in any other instance of a single fault the world can produce.”

**MINERAL COMPOSITION OF THE ROCKS.**—Quartz, felspar, mica, hornblende, chlorite, and epidote, are the mineralogical ingredients of the Malvern rocks, in numberless varied proportions; but it must be understood that the greater part of the mass is in a disintegrated state, breaking up into angular fragments of every size, and thus forming *débris* on, and materials for, soil at the base of the slopes; while hard masses of granitic rock, weathering the atmospheric wear and tear of centuries, are of comparative rare occurrence. This of course tends greatly to modify the capacity of these eminences as depositories of plants; and although rising up boldly in an insular manner in the midst of a flat district, and with no superior heights near at hand, their moderate altitude precludes the growth of any alpine plants, while their complete exposure to the blaze of summer even unfits them for various subalpine species that grow in shady localities farther south. As hornblende is more abundant in the chain than mica, and quartz and red felspar make up in general the constituents of the rocks, they may correctly be said to be *Syenitic*; but although the presence of *Granite* has been denied, and is indeed far from common, yet some rocks of the Worcestershire Beacon, and several masses on the North and End Hills, are truly made up of mica, quartz, and felspar, and hard and rugged as any granite.\* The Herefordshire Beacon and its dependencies present a different feature, for here veins of carbonate of lime are largely mingled with syenitic ingredients, and the rocks are of a very shivering nature. Further south some rocks appear of a basaltic kind; and within the cave on the Herefordshire Beacon, traces of a rough prismatic character may be traced on a close inspection. Veins of crystallized sulphate of barytes appear in crevices of the rocks about Great Malvern; and on the North Hill occasional crystals of quartz appear. A soft kind of serpentine occurs in the Herefordshire Beacon, and well-characterised gneiss appears in the hills south of the Wych, and in the Raggedstone Hill.

Felspar is the most abundant of all the Malvern minerals, and the most frequent combination that occurs is a mixture of felspar and

\* “Granite,” remarks Professor Phillips, “is much less abundant than syenite in the Malvern Hills, apparently because its micaceous element is less abundant than hornblende. In the Worcestershire Beacon varieties of rock may be collected from a very narrow area, some of which, speaking mineralogically, are syenite and others granite, just as in the crystallization of the mass the element of potash, or oxide of iron, was locally prevalent. In general these granitic rocks are to be regarded as local segregations in the syenitic masses, closely allied in nature and mode of appearance to the felspathic veins which appear in almost every excavation, ramifying amidst the hornblendic masses.”

hornblende, with a variable proportion of quartz. A mixture of felspar, quartz, and mica is less common. Crystallized felspar also appears in veins and ramified masses, and the same substance presents itself in great masses in a fine-grained or compact state. Mica, sometimes abundantly, may be seen in irregular forms and bands, or seeming dykes. Chlorite forms a segregated dyke, and is perhaps recognizable in a disseminated state.

**LOCAL APPEARANCES IN DIFFERENT PARTS OF THE CHAIN.**—It may be remarked, that the rocks of the Malvern axial chain are all of igneous origin, but the structural arrangement of the masses is greatly varied by local crystalline arrangement; therefore almost every hill puts on a different internal aspect, as the volcanic disturbance was continued more or less intensely, or interrupted. The limits of a short essay do not admit of lengthened detail, but it may be well to indicate those points most interesting to a geologist.\*

Phillips noticed various laminated felspathic and gneissic rocks forming beds that strike obliquely or directly across the chain, though inextricably entangled with the syenitic masses. Such seemingly stratified structures may be seen near the Wych, dipping S.S.E., and near the turnpike on the road to the Wych. These laminated beds are interposed between masses of trap. Gneissic laminations may be traced at many points north of the Herefordshire Beacon, and the footpath from Malvern Wells to the Wych is crossed by many examples of micaceous gneiss with flexuous laminæ. Near the western summit of Midsummer Hill are gneissic rocks ranging N.W. or W., and dipping steeply southward or northward; and in the east Raggedstone ridges of laminated felspathic rocks, and schistose rocks with mica, divide the ordinary traps in lines from N.E. to S.W., and from E. to W.

These laminated beds are regarded by the indefatigable geologist mentioned, as the lowest stratified rocks visible in the tract of the Malvern Hills; and "they seem consistent," he says, "with the supposition that these rudely structured rocks are fragmentary portions of strata once more regular, which formed a part of the sea-bed in periods anterior to the production of the Malvern syenites, became involved in the irruption of these, and by their action partially metamorphosed." Other observers had considered such broken-up stratified masses as altered Silurian; but according to Professor Phillips, "there is no

\* Those who feel interested in the subject will find full descriptions in Sir R. I. Murchison's great work on the Silurian System, 2 vols. 4to, or Professor Phillips's elaborate paper in the *Memoirs of the Geological Survey of Great Britain*.

reason for thinking that it is to any of the strata which surround the Malvern Hills that these supposed metamorphic rocks originally belonged ; the stratiform masses in the Malvern chain are certainly not continuations of any of the surrounding deposits, nor do any such masses occur among them."

Near Keysend Hill, at the southern termination of the chain, it might be inferred that the volcanic power remained latest in action, for on the north-western side of this hill run out several short lines of trappean protuberances, generally directed towards the north-west, and broken into narrow elliptical or almost circular bosses, rising above the surrounding surface, which is partly formed of black shales (whitened near the trap) and partly of greenish sandstones, which Sir R. I. Murchison has called "volcanic grits," and supposed to be formed by marine volcanic ebullitions during the earliest accumulations of the strata of the Silurian system. Ten or more of these bosses may be counted between Keysend Hill and Rowick, all occurring in comparatively low ground, under the outcrop of the Caradoc sandstone in Howler's Heath. The green volcanic sandstones may be well observed on the western flank of Raggedstone Hill, by the road-side leading to Ledbury. Great dykes of felspathic trap traverse the sandstones.

The Raggedstone Hill, north of Keysend, presents several appearances worthy of notice, forming two summits of nearly equal elevation. From between them a deep and singular valley is scooped out to the south, and afterwards turns eastward. On the western side of this hill the volcanic sandstones rise nearly to the summit. At the south end of the hill they are seen dipping W.  $60^{\circ}$ , and in places appear arching over to the east, being supported on irregular bosses of felspathic trap. At the N.E. end of the hill is a remarkable exhibition of the peculiar brecciated rock that appears at many points along the eastern face of the Malverns. Phillips remarks that "in no part of the Malvern hills are the trap rocks more varied in character than in the Raggedstone ; nowhere do they depart more widely from the syenitic type, and approach more nearly to the ordinary aspect of eruptive trap, abounding in compact felspar. Consistent with this fact is the observation, that in no part of the Malvern chain is there so much of a metamorphic character in the adjacent Palæozoic strata ; and these are the lowest clearly sedimentary deposits which appear in the district." At the southern extremity of the hill appears a central axis of red felspathic trap, over which are schistose rocks in arched and twisted masses ; farther from the trap appear highly indurated altered

volcanic sandstones, with confused joints; and above these the sandstones are regularly bedded and laminated, with fucoidal impressions, and otherwise quite unaltered.

Midsummer or the Holly-Bush Hill is distinguished by the remarkable transverse valley between its twin summits, which are surrounded by a supposed Danish intrenchment. The great mass of this hill is syenite, but the western height shows in its north-eastern and northern parts the gneissic laminated rocks before referred to, ranging N.W. or W., and dipping S.W. or S.

Passing on to the Herefordshire Beacon, it is noticeable that this grand mass occupies a greater breadth than any other part of the Malvern chain, with considerable eastern buttresses of felspathic trap and greenstones. It shows much variety of mineral composition, and the exposed rocks are of a shivering nature, and easily disintegrated. The high western ridge is marked by the great British camp, with its numerous trenches; and here is the continuation of the true syenitic axis from Swinyard or the Warren Hill. The Beacon is of syenitic character, or, says Phillips, "even granitic when mica prevails; traces of beds and laminae are common, especially where hornblende abounds." On the western side of this hill the Silurian strata, disturbed and nearly vertical in places, are pressed up against it, but actual contact is concealed by detritus.

At the Winds' Point is a large quarry forming a very confused mass of felspar, quartz, mica, and hornblende, and there is an appearance of imperfect stratification. Phillips, who has so well studied the Malvern district, thus remarks here: "The beds are more or less undulated and even twisted, but generally dip northwards about 30°. Joints ranging nearly east and west cross these beds, and are lined by much carbonate of lime, some quartz, and a little sulphate of barytes. Slickenside surfaces indicate motion in various directions, and some of the fissures are somewhat venigenous; masses of mica, hornblende, and felspar may be picked up almost unmixed with other ingredients, and the degrees of their admixture are endless. There is no great felspar dyke or granite vein; but the masses of these substances are large, and irregularly mixed with the bedded hornblendic rock. In the descent of the road toward Little Malvern a few seeming dykes occur [one of hornblende may be especially noted], and laminated gneissic and hornblendic masses are seen dipping in various directions. Proceeding along the summit, we find in almost every ridge and hollow some fresh combination of the felspathic, quartzose, hornblendic, and



micaceous elements, which make up the endless varieties of the Malvern rocks. In a few places epidote veins are traceable."

The cutting through the Wych shows abundance of the ordinary syenites, and segregations of felspathic and hornblendic masses, while at the east end a remarkable chlorite vein is seen, with red syenite on either side of it.

In the Worcestershire Beacon, the loftiest of the range, and rising above Great Malvern, Phillips states that "the rocks are in some parts large-grained granite; elsewhere, a binary mixture of felspar and quartz; in other places true large-grained syenite, or fine-grained hornblende rock; and the admixture of these varieties is frequent and sudden. In no hill is the abundance of quartzo-felspathic veins more remarkable than in the Worcestershire Beacon, and the crystallization of felspar is on so large a scale as to give plane faces of several inches in breadth. Almost graphic granite is produced by the arrangement of the quartz crystals in the felspar." A mass of quartz in excess, as if forming a dyke, is very observable on the western face of the Beacon, not far from its summit. A vein\* or segregation of gold-coloured mica appears in the neck of the narrow ridge between the summit of the Beacon and the Wych, near an old mining excavation; and combining the tradition of the old sinking with the spangled mica, the country people have given the name of "gold-mine" to the spot, and the passing stranger will generally find "gold" forced upon his acceptance by the look-outs at the spot, who will look merely for vulgar copper in exchange! Copper ore, in fact, was once sought for at this spot, but none of any consequence was discovered.

In the North Hill the rocks are composed of varied syenitic elements; one presents a nearly equal mixture of largely-crystallized felspar and hornblende, with variable proportions of quartz; and another abundant rock is full of reddish felspar, with much quartz and far less hornblende; this contains veins of epidote, which are seen also in the End Hill. A third kind consists of fine-grained hornblende. On the north-east face of the North Hill the rocks are bordered by detritus,

\* Appearances of veins are frequent in the Malvern Hills; felspathic veins two feet wide appear near the Wells, and a vein of chlorite is cut through at the Wych; below Winds' Point hornblende veins also appear, crossing bedded and laminated syenite. Professor Phillips, however, says: "But these, and many others like them, are perhaps extreme cases of segregation, not really veins filling fissures. Such veins, indeed, except of an inch or so in breadth, where they are composed of quartz and mica, or of pearl spar, or of sulphate of barytes, can hardly be quoted in these hills, and hence it is no wonder that mineral veins are entirely absent."

concealing the new red marls that approach them; and here occurs the curious conglomerate or brecciated trap, which seems to show some sudden uprise or displacement of the chain, partial or general.

The syenite suddenly ceases at the End Hill, at whose western and northern base lower Silurian beds appear; but it continues in a N.N.W. direction, for about half a mile from the End Hill two remarkable bosses of syenite rise up in Cowleigh Park, and another juts up still farther northwards, on the opposite bank of Whippet's Brook. Sir R. I. Murchison thus alludes to them in his great work on the "Silurian System:"—"These knolls represent in miniature the whole chain of the hills. The centre of the first boss consists of greenstone, having upon each side reddish felspar rock, both granular and compact. On the western flank, dark purple, red, and green marls are thrown up in vertical beds, with much decomposed matter between them and the dyke. On the eastern side is a quartzose sandstone, almost in the state of quartz rock, the strata being vertical; and a little beyond this it is succeeded by conglomerate quartzose grit. The little knoll which affords this section rises only about thirty feet above the road. The dislocated and altered strata on its sides are evidently the grits and sandstone of the Caradoc formation, which we trace to large masses in Old Storridge Hill on the north, and Howler's Heath on the south. In the other knoll north of Whippet's Brook, the flanks of the syenitic greenstone are wrapped round by highly-inclined beds of quartzose felspathic conglomerate, which has been largely quarried for a roadstone. This therefore is perfectly analogous to the cases of hard and vertical conglomerate and volcanic grits which are thrown off the western flank of the syenite of Midsummer Hill, and other points of the Malverns. The direction of these knolls points to the trappean hills which re-appear on the left bank of the river Teme, between Knightsford Bridge and Abberley; and along the intermediate space ridges of the Silurian rocks are thrown up in dislocated masses, the general strike of which is parallel to the main direction of the intrusive rocks, namely, from S. and by W. to N. and by E."

The last prolongation of the rocky axis of Malvern is to be seen in a small mound of red syenite situated between the old and new red sandstones about eight miles to the north, in the middle of an arable field on the Berrow Farm, and at the north-west base of the Berrow Hill near Martley.

ORIGIN OF THE MALVERN ROCKS.—The igneous origin, entire fusion, and generally unrestrained crystallization of the mineral com-

pounds contained in the Malvern Rocks, is now universally admitted. But some difference of opinion exists as to their geological epoch. Formerly they were termed "primitive," while later writers have regarded them as comparatively modern products of heat. Sir R. I. Murchison regards the Malvern syenite as breaking into, shattering, altering, upraising, and reversing the Silurian strata, as if it was erupted posterior to the deposition of the upper Silurian beds; while John Phillips, from the anomalous gneissic laminations entangled with the syenite, which he suggests are portions of stratified masses of a sea-bed *more ancient than the Silurian*, would throw back their first irruption still farther into the eternity of the past. "There is no instance," he remarks, "of the Malvern trap occurring as dykes among the ancient palæozoic or mesozoic strata; no good case of metamorphosis along their borders, nor any probability that they have been in fusion since the era of even the earliest Silurian strata on the borders of the Malverns, unless this should be thought to have occurred in the southern parts of the chain, in the Raggedstone Hill, near which other kinds of trap have certainly been effused in a melted state during the Silurian period. In the northern part of the chain the anteriority of these rocks to the greater part or all of the Silurian strata appears clear."

If this view be taken, then it would appear that the Malvern compounds, after fusion, and from the irregularity of their structure, subjected probably to irregular rates of cooling and local electrical phenomena, were solidified at some depth beneath the ancient sea, and thence raised up *en masse* along a great line of fracture passing through them on the eastern side. "The upheaval of this mingled mass from a considerable depth has impressed upon it some additional characters. The upheaval appears to have been violent; hence the abrupt truncation of the eastern face against the new red sandstone plain, the striation and furrowing of that face, the brecciated structures along it, and the numerous lesser faults and cracks which traverse and split the rocks in points adjacent to the surface of greatest displacement. The vertical amount of this displacement cannot be less than some thousands of feet."\* But it is by no means improbable that partial movements, and irruptions of other igneous matters, continued in the vicinity of the Malverns until some time after the deposition of the New

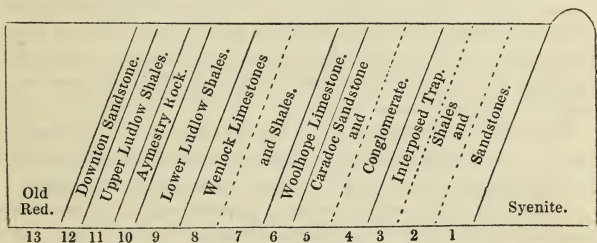
\* Professor Phillips—*The Malvern Hills compared with the Palæozoic Districts of Abberley, &c.*



Red System ; and trappoid conglomerates, and local outbursts of basalt in the vicinity of the new red sandstone, appear to confirm this view.

I now turn to the consideration of the Palæozoic strata deposited around the Malvern rocks, and upreared with them, or through their agency.

**PALÆOZOIC STRATA WESTWARD.**—The western strata consists of what Sir R. I. Murchison has well denominated “the Silurian System,” consisting of a series of conglomerates, shales, sandstones, and limestones, placed below the old red sandstone ; but as the old red of Herefordshire has been deposited in a trough, rocks similar to those on which it rests in Shropshire, West Hereford, and South Wales, rise from beneath the *eastern* mass of old red sandstone, as shown in the transverse section in the frontispiece, or as may thus be placed in type, the beds dipping *westward* from the Syenite :—



“The Silurian rocks,” observes Sir Roderick Murchison, “though occupying a narrower zone than in Shropshire, constitute an almost continuous band from the northern end of the Abberley Hills to the southern end of the Malverns, a distance of nearly twenty-four miles ; and though the strata are dislocated, and even through a course of four miles *reversed*, yet they maintain a prevalent inclination to the west, dipping beneath the old red sandstone.”

Since the publication of Sir R. Murchison’s great work, Professor John Phillips, of the Government Geological Survey, has made such an exact exploration of the Malvern ground, that but little remains to be done to add to the information contained in his elaborate paper, and to that the student must refer for more particulars than can be here detailed. The following description gives a good general idea of the appearance of the Silurian strata as they abut westward upon the Malvern Hills :

“Through the whole of this district, west of the Malverns, we may with care follow three ridges of limestone, and one of Caradoc sandstone; and where, as in the country between Ledbury and Midsummer Hill, several anticlinal and synclinal axes of movement pass, the number of ridges is very much increased. Between Ledbury and Hope End, within the breadth of a mile, are several such axes passing north and south; another occurs about Rose Hill and Bank Farm; and in each of these cases the calcareous ridges are frequent and easily recognised. The most striking of all the ridges thus noticed, in all parts of the district west and north of the Malverns, are the two which are supported by the calcareous coherent nodules of the Aymestry rock, and the more solid Wenlock limestone. Of these, the first-mentioned rises almost universally to the highest ground, but the latter makes the most continuous elevations. Both are, however, crossed by many small hollows and glens, not always yielding passage to streams, and frequently so circumstanced as to appear rather to have been marked out for easy erosion, as lines of weakness, by deficient deposition or unequal displacement of the beds, than to have been scooped out by mere watery violence.”

The strata already indicated may now be taken in vertical succession in the ascending order, the numbers referring to the diagrams of transverse sections shown on the frontispiece and the preceding page.

1. *Hollybush Sandstone*.—Strata of a greenish colour, the lowest of the series seen westward. These sandstones have a trappean aspect, and contain no organic remains except fucoidal impressions; in contact with the Malvern syenite on the western side of the valley between the Hollybush and Raggedstone Hills.

2. *Black Shale*.—Finely laminated black shale, alternating with, and superimposed upon, the green sandstones on the western bases of Keysend, Raggedstone, and Midsummer Hills. It yields minute trilobites between Fowlet Farm and the hamlet called the “White-leaved Oak.”

3. *Interposed Trap*.—Phillips gives some interesting details of this rock, which, he says, forms “porphyritic and greenstone masses, which erupted from below, have flowed in limited streams over the surface of the black shales.” More than twelve little isolated bosses of this trap appear between Keysend Hill and the obelisk in Eastnor Park, along the western boundary of the black shales.

4. *Caradoc Conglomerate and Purple Sandstone*.—Purple and grey conglomerates and sandstones from 300 to 600 feet in thickness, and

presenting themselves in various places, from Howler's Heath on the south, by the Obelisk Hill in Eastnor Park, to the base of the Worcestershire Beacon, above Dowlas New Church, and round the North Hill to Rough Hill Wood in Cowleigh Park. Some of the beds are productive of the earliest forms of animal life in the Malvern district, with the exception of the trilobites in the black shales.

5. *Caradoc Sandstone*.—A mass of grey laminated sandstones and shales of the thickness of 500 feet. This rock may be well seen and studied in Ankerdine Hill, near Knightsford Bridge,\* its most northerly extension, from whence it is lost till it reappears in the fine dome-shaped hill of the Old Storridge, prolonged thence by Rough Hill to Cowleigh Park Woods, and by the base of the Worcestershire Beacon to Stoneyway and the Winds' Point, &c. About Rough Hill the Caradoc is half a mile wide, but between the Worcestershire and Herefordshire Beacons it does not exceed a quarter of a mile. It is seen again in New's Wood and at the Obelisk Hill, and may be traced on to Howler's Heath. Numerous fossils are found in the Caradoc beds, especially *Tentaculites*. A singular conglomerate of this rock, embodying syenitic fragments with shells, was discovered by Mr. Phillips near the western base of the Worcestershire Beacon, from which he inferred the high antiquity of the syenitic rock.

6. *Woolhope Limestone*.—This band of impure limestone, with occasionally intervening sandstones (10 to 150 feet), tops the Caradoc, and may be seen at various points, from Howler's Heath to Cruce Hill and Alfrick's Pound, where it appears widest, the dip there being moderate. It contains numerous *Brachiopoda* and other fossils.

7. *Wenlock Shale*.—Soft shales, with bands of limestone nodules, about 640 feet thick. From Winds' Point to near Knightsford this formation may be seen in many places, distinguished by its nodular masses, but is not easily observable south of the Herefordshire Beacon.

8. *Wenlock Limestone*.—Beds of nodular limestone, with soft interstratified shales, from 100 to near 300 feet thick. When well developed, this limestone appears in three or four stages, with alternating shales, but is often reduced to one limestone rock, covered by and resting upon several bands of argillo-calcareous nodules. It shows itself grandly in "the Ridgeway" of Eastnor Park; and various quarries mark its course thence by the western base of the great Camp Hill to Colwall

\* The geological sketch of the Malvern syenite, in connexion with the Silurian and New Red Systems, fronting the title, is taken from this point. Ankerdine Hill is 570 feet high; Rosebury Rock, 378 feet; and the Old Storridge, 732 feet.

Copse, Mathon Park Farm, Castle Copse, Croft Lime Works, and the high woody ridge which crosses the road to Froom's Hill, near Cradley turnpike. In fact, from Clincher's Mill southward to Suckley northwards, limeworks dot the crests of the hills of this formation throughout its course. Numerous organic remains, including *Polyparia* of large dimensions, are found in the beds of the Wenlock lime. Here also numerous *Trilobites* occur, and broken *Encrinites*.

9. *Lower Ludlow Shales*.—Grey shales, with argillaceous and calcareous balls in layers, of about the thickness of 700 feet. Seen in various places, from Ledbury to Tundridge, and well exhibited between Old Castle Farm and the Herefordshire Beacon; it crosses the Hereford road between the turnpike on Chance's Pitch and Eastnor Lodge, where the beds of argillaceous balls appear vertical.

10. *Aymestry Rock*.—Shaly and calcareous beds, full of irregular concretionary nodules of limestone, from 10 to 40 feet thick. These bands crest the long ridges near the extreme western border of the Silurian surface. From Chance's Pitch, where they are well observable, they deflect from the Malvern chain, and split into three parallel lines towards Ledbury; and in this vicinity several singular synclinals occur, well detailed by Professor Phillips. *Terebratula Wilsoni*, and other fossils, are met with in this rock.

11. *Upper Ludlow Shale*.—Arenaceous shale, with thin irregular masses of shelly limestone, from 100 to 200 feet in thickness. In the Malvern district this is a thin member of the shaly series of Silurian deposits, narrow and sinuous in its course. It may be traced from the west side of Dog Hill and Frith Wood, Ledbury, to Lord's Wood, Knightwick. *Leptæna*, *Orbicula*, and other fossils, occur.

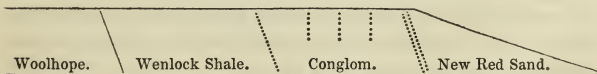
12. *Downton Sandstone*.—Laminated sandstone, brown, yellowish, grey, or white, 10 to 100 feet thick. "These laminated sandstones," says Phillips, "form the passage from the protoxidated Ludlow shales and sandstones to the peroxidated shales and sandstones of the old red series. They can generally be in some degree traced at most points where the sections are tolerably clear. They are quarried at the west side of Raycomb Wood and Raffnal Wood, and again in the fields north of Mathon Court, and at Brockhill, and make excellent flagstone." Brockhill offers a good general section of the junction of the Old Red with the Silurian strata. Numerous fossils are met with in the upper Ludlow rocks; and these are mostly different from those in the Wenlock limestone, or the lower Silurian. One species only (*Coronulites serpularius*) occurs in all the beds. South of Ledbury the Lud-

low rocks are not apparent; for, as Sir R. I. Murchison observes, "the prevailing feature of the Silurian rocks south of Ledbury is, that the Wenlock Limestone is brought directly into contact with the edge of the Old Red Sandstone, the Ludlow formation being entirely omitted."

13. *Old Red Sandstone*.—This is a deposit of great thickness, and in the Malvern district is every where in contact with the Downton beds or Ludlow shales, westward from Haffield Camp to the slope of the Suckley Hills. From this line it spreads westward to Bromyard, Leominster, Hereford, and Ross, into one broad area, broken only by the long Silurian elevation of Woolhope Forest.

Organic remains are very prevalent in the Woolhope and Wenlock limestones, as well as in the Ludlow rocks, such as *trilobites*, *orthoconites*, *corallites*, and characteristic *conchifers*; while, just below the Wych, a fine coral-reef is brought to light by the syenite, displaying numerous *madrepores*, *alcyonia*, &c. Colwall quarry is a good place for a collector to visit.

MESOZOIC STRATA EASTWARD OF THE MALVERNS.—The country to the east of the Malvern chain consists of the new red marls and sandstones, unconformable where they abut upon the Silurian strata, and deposited subsequently to the upheaval of the syenite, though probably disturbances still continued along the axial line at intervals; and thus at Great Malvern red sandstone appears some distance above the base of the North Hill. I can only here allude to the peculiar *trappoid conglomerate* forming the base of the New Red system which appears at Haffield Camp, near Redmarley, south of the Malvern chain, and at several points northward, as at Whippet's Farm, Callow's Leap, near Alfrick, and Rosebury Rock, and caps the Berrow Hill, Martley, Woodbury, and part of Abberley Hill. At Callow's Leap it thus appears, with the red sandstone to the east, and the Wenlock shales and Woolhope series westwards, and has a very trappoid aspect.



The summit of Rosebury Rock, near Knightsford Bridge, is formed of this peculiar conglomerate, and here the trappean fragments are of all sizes below a foot in diameter, and mingled in great confusion. Though rudely bedded in some parts, it has still much the appearance of a dike



in the sandstone; and a few years since, when a new path was cut about halfway up the rock, *actual basalt* was broken into at one point in mass. Hence it appears that Sir R. Murchison's inference as to the conglomerate concealing centres of pyrogenous rock at the Berrow and Abberley Hills is most probably correct; though Mr. Phillips, while admitting that their included fragments are of a peculiar character, thinks "they must be regarded as due to the violent succussion and re-aggregation of local and peculiar rocks, whether any trace of these now remain as nuclei of the hills, or the origin of the fragments was a not far-removed metamorphic range now invisible."\*

Many places mentioned in this geological sketch are almost as interesting to the botanist as the geologist; for the former must extend his researches beyond the "herbless granite" of the hills to the more fertile and tempting Silurian woods; and wherever the limekiln smoke appears trailing over the side of the ridge, he may look with good expectation of finding many of those plants that more particularly attach themselves to calcareous surfaces.

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## SECTION II.

### PRESENT APPEARANCE OF THE HILLS, CLIMATE, SPRINGS, LOCALITIES OF PLANTS, &c.

GENERAL APPEARANCE AND ASPECT OF THE HILLS.—From the period when the vicinity of Malvern was "a wilderness, thick set with trees," above whose solemn umbrage the BALD HILL (for such is the derivation of the conjoined British words *Moel Wern*) must have peered with fine effect, charming the Saxon monks to its peaceful solitudes, down to the present day, these eminences have never wanted visitants or admirers. Whether the ancient Britons or the conquering Romans did more than form and occupy the noble fortress on the Herefordshire Beacon, it may be difficult to say;† but the monks of the two priories

\* Phillips—Mem. of Geol. Sur. ii. p. 162.

† I have a silver coin of Vespasian, found in a hole excavated by sheep on the Worcestershire Beacon, where perhaps more lie still concealed. An urn full of brass Roman coins was also found a few years since at Little Malvern. A small sepulchral urn, with bones, was discovered by the Ordnance surveyors, in 1849, in a cavity of the rock, covered with soil and stones, on the summit of the Worcestershire Beacon—the remains, doubtless, of some powerful Silurian chieftain or

of Great and Little Malvern at all events sanctified the salubrious waters of the hills, by giving the name of the Holy Well to one spring, and dedicating the other to St. Anne. We may rest assured, therefore, that whatever interest the saints may have taken in the matter, something was known of the curative qualities of pure spring water, even in those comparatively unpolished times. The monks of Great Malvern, however, not satisfied with the attractions of the scenery and the health-restoring spring of St. Anne, superadded thereto the potent spell of superstition, having within their Abbey Church a highly venerated image or shrine, which was so much resorted to, that it is especially denounced by Bishop Latimer in his stern but quaint sermons.\*

Camden remarks, that the Malvern Hills seem to rise "like stairs one above another;" and this homely simile is very apt, when the hills are viewed near or somewhat north of Worcester, when from the lowest southern hill there appears a gradual rise from south to north, the apices of the Worcestershire Beacon and North Hill terminating the view. This stair-like aspect is not, however, so obvious when the hills are viewed farther south, as then the broad mass of the Herefordshire Beacon is brought into view, and this noble hill then appears to rise in the centre of the chain, its subject heights undulating from it on either hand. The best view of the entire chain is that, perhaps, obtainable from the escarpment of the Cotswolds, near Cheltenham, or from Breton Hill, near Pershore; but a shortened though very characteristic view of the eruptive axial syenitic ridge, in connexion with the uplifted Silurian strata, may be seen from Ankerdine Hill, near Knightsford Bridge. The entire length of the hills from north to south rather exceeds nine miles; the breadth is variable, at the utmost not exceeding a mile, and this only occurring at the gorge, where the Herefordshire Beacon boldly falls back to the westward, near Little Malvern. In many places it is less than half a mile.

The natural bulwark these hills present was not neglected by the ancient inhabitants of the country, who appear to have made a permanent fortress of the Herefordshire Beacon, which, as commanding the pass into Herefordshire, was best adapted to the purpose. This remains intact in all its grandeur, and is one of the finest specimens of British fortresses in the kingdom, the highest part or prætorium being sur-

regulus of the country. This came into my possession soon after it was found. The bones had evidently been subjected to cremation. What a sublime position for a patriot's tomb!

\* Latimer's Sermons preached before King Edward.

rounded by a very deep fosse. The late Dr. Card published a dissertation to prove that this was occupied by Caractacus, the great Silurian prince.\* Midsummer Hill, three miles to the southward, presents another extensive vallum and fosse surrounding both it and the eastern height, called the Hollybush Hill. This has been considered as Danish. A trench called the Earl of Gloucester's Ditch is seen on the ridge of the Worcestershire Beacon, and was made to divide the possessions of the powerful Earls of Gloucester from those of the church of Hereford.

The Malvern Hills, when seen from a few miles' distance on the eastern side, have a peculiarly smooth and rounded aspect; and till within the last thirty years nearly the whole chain constituted sheep-walks, of course kept constantly closely nibbled, and the grasses and plants diminished to the smallest size.

"The fairest flocks  
The close-wov'n carpet graze; where Nature blends  
Flow'rets and herbage of minutest size,  
Innoxious luxury. Wide airy downs  
Are Health's gay walks to shepherd and to sheep."—DYER.

A great portion of the hills now, especially on the western side, remain in their pristine aspect; but on the eastern or Worcestershire side enclosures have taken place to a very considerable extent, and unfortunately with much deterioration to picturesque effect, so that the end of the Worcestershire Beacon near the Wych looks as if a great patchwork bed-quilt had been thrown over it. The turf extends to the very summit of the hills, but is relieved on the sides in many places by dark round tufts of gorse, numerous scattered dwarf and stunted hawthorns, brambles, &c., or by clumps of aged elder-trees, as about the Warren on the eastern side of the Herefordshire Beacon; or still better, by fine bushes of verdant holly, as at the Hollybush Hill. Here and there, especially on the sides of the ravines, masses of rock start boldly out, and most of these are finely bearded with a growth of ferns and mosses, or hoary and "siller gray" from an extensive spread of lichens, such as the *Parmelia saxatilis* and *perlata*, or the beautiful coral-like polished *Sphærophoron*. The growth of mosses is here so rapid, that many rocks have been quite encompassed by, and are now nearly hidden by them; a soil is thus by degrees accumulated to such an extent, that wherever a patch of ground is enclosed it is soon made

\* Near the exterior trench of this camp, in the parish of Colwall, a labouring man found a valuable gold coronet, or armlet, supposed to have belonged to a British prince, while digging a trench in the year 1650.



sufficiently productive, abundant mould covering the rocky foundation on which it rests. A temptation is thus offered to make continual accession to the enclosures, notwithstanding the steepness of the glacis of the hill. A good relieving artistical feature is given to the hills at all times by the fallen stones in the ravines; for though these are shapeless enough close at hand, and with small pretensions to beauty, yet in the distance they assume a deep purple hue, which contrasts well with, and breaks the uniformity of the green turf. In summer, the immense quantities of foxglove (*digitalis*) give a rich pink hue to the rocky slopes they cover, often mixed with the tall golden torches of the great mullein; while in other spots a purple mantle is created by the flowering of the wild thyme. As autumn slowly approaches, the gorsy patches sparkle most refulgently, though their golden splendour is somewhat chastened by the burnt umber of the withered brakes, extending far and wide, and scorched by the blaze of August. In May the hawthorns and mountain ashes wave on the sides of many of the ravines in milk-white purity, while in autumn their pendent coral berries give another phase of beauty to the inspiring and diversified scene.

CLIMATE OF MALVERN.—The climate to which any locality is subjected must always influence its vegetation to some extent, in connexion with the elevation of the spot. It is advantageous, therefore, to understand the bearings exercised by meteorological phenomena, such as temperature, the direction of the winds, &c. It is popularly said, and I believe correctly too, that in the winter season it is warmer at the bases of the hills than in the flat country five hundred feet below; and thus many exotics will flourish through the winter in the open air at Malvern, which would perish by the night frosts in the lower country. This was observed to be the actual fact in the winter of 1839-40. Perhaps this curious circumstance may be explained by the following extract from an elaborate paper of Dr. Addison's on the *Medical Topography of Malvern*.\* "The ground gradually sloping from the village, facilitates, in a material degree, the subsidence of the cold damp air which results from the cooling of the earth by *radiation* at night; and very frequently a dense fog may be seen overspreading the vale below, while the village is quite clear, and enjoying the bright and warm rays of the sun. At such times the thermometer, at night, *falls several degrees lower in the plain than at Malvern*, particularly if the atmosphere is

\* This gentleman has paid much attention to the Meteorology of the district, and in the pages of the *Analyst* has instituted "A Comparison between the Climates of Great Malvern and London," full of curious details.

calm ; an evident indication that moderate elevations are much less subjected to the effects of terrestrial radiation than places lower down. The houses at Malvern appear to lie between those fogs which result from the cold of radiation, and those descending from above ; and speaking from my own observation, I should remark that they are oftener enveloped in the latter species of fog than the former. When the lower edge of a cloud descends so as to obscure objects raised only 500 or 600 feet above the mean level of the earth's surface, the barometer will generally be found low, and the temperature, except perhaps in the summer months, above the mean of the season ; so that these may truly be called *warm fogs*, in contradistinction to those which rise upward by the gradual thickening or deepening of the cold, misty, and too often malarious stratum below."

Dr. Addison made a series of careful meteorological observations in 1834 and 1835, which he considers may be taken as generally applicable ; and from these it appears that the mean temperature of the months at Malvern stands thus : January 38·6, February 42·7, March 42·4, April, 47·7, May 51·6, June 59·0, July 60·5, August 60·0, September 56·6, October 50·2, November 43·7, December 42·7. The mean temperature for the whole year is 49·6, while that of London is 52·0 ; but then in summer, while the mean temperature of London is 65·2, Malvern is but 59·8, thus showing its pleasantness and salubrity at that season. On the same authority, in the years of observation alluded to, there were 219 days when vapoury winds prevailed, that is, ranging from south-east to west, and 146 days when the currents set in from the dry quarter, or from north-west to east ; thus the moisture that prevails from this circumstance during so great a part of the year necessarily allows *cryptogamous* vegetation to flourish in the greatest abundance ; and though of course dormant, the summer heats scarcely check the retentive vitality of these plants. But it is different with respect to *phanerogamous* plants, few of which, of the subalpine species, can bear the open exposure to the sun to which the bare rocks of Malvern are exposed at midsummer ; though *Sedum album*, which no drought can destroy, finds an appropriate home among the arid cliffs of the principal hills, flowering when most other plants are completely withered and burnt up by the intolerable heat.

Westerly winds are generally the most powerful and troublesome on the ridge of the Malverns, where they often break with thundering sound, the hills lying completely open from their north and south range to this tempestuous weather quarter ; and, coming over the top of the

hills with great force, they often descend down the ravines and round "the Winds' Point" in furious gusts and eddies, filling the air with dust or rhime as the case may be. This fury of the winds stunts the growth of plants on the summit of the hills considerably; for *Carlina vulgaris*, though often luxuriant on the sides of the hills, is diminished in height to a couple of inches or less at the summit; and *Myosotis collina* would be invisible among its dense growth of hairs, but for the brilliant azure of its minute blossoms. The westerly gales have sometimes brought here on their wings birds in a dead or exhausted state from great distances. In the collection of birds made by John Walcot, Esq., and now temporarily deposited in the Museum of the Worcestershire Natural History Society at Worcester, is a specimen of the Tropic-bird (*Phaeton ætherius*), which was picked up a few years ago at Cradley in a dead state.

Strong winds, however, blowing from the west are almost unfelt at Great Malvern, while at North Malvern their ordinary force is augmented by the horizontal contraction of the stream of air; but at Great Malvern, even when winds are blowing from the eastern quarter, strong on the plain below and violent on the ridge, yet a calm prevails in the village, as the steepness of the front of the hills deflects the currents of air, acting as a dam in a rapid stream of water would do, stilling the motion below, while the fluid rushes over the top. In fact, along a narrow chain of hills strong winds are more felt on the leeward than on the windward side.

PHENOMENA OF SPRINGS.—Prills of water gurgle down both sides of the Malvern chain into brooks that irrigate the vales, but the moderate height of the hills precludes any fierce or very copious outgush, and a dry season reduces even these tiny murmurers to mere silvery scarcely visible threads. The surface is generally very dry, for the rain that falls sinks at once into the fissures of the rocks and reappears in many springs at about the level where the steep slopes of the hills end, and the rocks are covered by the strata of the lower ground. The celebrated springs of St. Ann's Well and the Holy Well (both eastward), however, have their origin much higher than this, St. Ann's 820 feet, and Holy Well 740 feet [Phillips]; while at the pass between the Worcestershire Beacon and North Hill, water rises at above 1000 feet. On the western side, the springs in contact with the Silurian strata contain carbonate of lime; and some of those on the eastern side, flowing through decomposing trap, imbibe chalybeate impregnations, and this is the origin of the chalybeate spring at Great Malvern.

The most powerful stream of water that descends from the Malvern Hills is the one that takes its rise in the eastern ravine of the Herefordshire Beacon, where several springs accumulate in a morass above the Warren Farm House, and thence pour rapidly along the dingle that extends to the base of the Black Hill, now planted with larches. This, where it passes the farm-house at the foot of the hill, would be fitted for a mill-stream. The Gullet glen, southward, is deeply excavated by the rill that waters it, often sounding hoarsely though out of sight. On the western side of the hills, Walm's Well, on the declivity of the Herefordshire Beacon, and Moorall's Well, Colwall, have been celebrated for their curative powers.\* There is, besides, at Great Malvern, in the flat below the road, a very fine spring of pure water called the Hay Well, the temperature of which Dr. Addison found to vary from  $50^{\circ}$  (air at  $30^{\circ}$ ) to  $52^{\circ}$  (air at  $75^{\circ}$ ). The temperature of the Holy Well is usually  $49^{\circ}$  to  $50^{\circ}$ , and St. Ann's Well,  $47^{\circ}$  to  $49^{\circ}$ . From various experiments and analyses of the waters of these springs, made by several observers, it appears that they are of extreme purity. Dr. Addison found that a gallon of the water of St. Ann's Well yielded only three grains of solid matter, consisting of muriate of magnesia, muriate of soda, sulphate of magnesia, and sulphate of lime, with a little siliceous matter. He therefore thinks this water may be pronounced the purest in Britain.

The western springs that flow through the Silurian strata deposit occasionally a little tufa, but not to any appreciable amount, though some have a "petrifying" celebrity.

LOCALITIES OF PLANTS.—The stranger who proposes to botanise in this district must not expect to gather all its remarkable plants in a cursory ramble on the hills. In fact, most of the rarer plants occur rather in the valleys, or about the woods at the base of the chain, than on the rocky summits themselves. But if the botanist has a few

\* It is rather remarkable that formerly popular opinion was so strongly in favour of the healing powers of Malvern water, that baths were formed at all the celebrated wells, open to every body, and much frequented by the lower classes especially. In Bannister's *Breviary of the Eyes* (1622) it is stated :

"Great speech of Malvern hills was late reported,  
Unto which springs people in troops resorted."

But of late years these common baths have been pulled down; and the halt, the blind, and the scorbutic, preferred the parish doctor to the "holy well." The water-system has now, however, assumed a new and a brighter phase, and "people in troops," but of a higher class than formerly, come to Malvern for the aid of its fashionable hydropathic physicians.

leisure weeks to dispose of, with a zest for ramble, he will find abundant scope for observation and enjoyment.

Early in the spring, the wood-spurge throws a light green verdure about the declivities, contrasting well with dead grasses, withered brakes, and the dark tufts of yet unflowered gorse; soon after, tufts of broom in many spots vein the hill-side with golden gleams; and about midsummer, the fronds of the brake give a verdant cincture to the then arid masses of rock, bearded with crisp lichens. But on the rocky masses themselves much depends upon a showery season, as then minute plants are well developed, scarcely observable at any other time.

The vegetation of this district may be traced in three divisions, accordant not only with the obvious surface aspect of the country, but with its geological relations. The first division comprises the flat country eastward of the hills to the Severn,\* whose course, setting aside curvatures, is nearly parallel to the Malvern chain, the distance from the river varying in the space between Worcester and Tewkesbury from five to about seven miles. The whole of this plain consists of red marl, with deposits of diluvial gravel in various places, close to or within short distances of the river. To the south of Upton, several isolated hills of lias limestone occur; and north of that town various tabular or roof-shaped hills of red marl, more or less covered with wood, run parallel with the Severn, and beautifully diversify the scene. Even nearer the hills, especially southwards, many fortress-like eminences start up in a picturesque manner, and, robed with foliage, greatly relieve the tame flat that would otherwise present itself.

Yet the wide green commons that stretch around the hills eastward, belted in by woodlands and ever verdant, have a peculiar and pleasing character under varying atmospherical influences, when in a summer afternoon the great mountain shadow covers them in gloom, slowly impinging upon and lessening the farther landscape's brightness; and, pictorially, it must be regretted that such recent innovations have been made upon the extensive waste of Welland Common, that, for some time to come, that part of the country must assume the appearance of a surveyor's map.

The drainage of the whole district is received by the Severn, even from the Silurian limestone on the western side of the ridge; for the river Ledden, that, flowing past Ledbury, collects the streams from the

\* Although I have made the Teme my northern boundary to Powick, from the latter place to Worcester I have, for convenience' sake to local botanists, followed the Laughern Brook to Henwick.



southward, after a farther course of ten or twelve miles, flows into the Severn at Gloucester. Throughout the whole eastern plain no lake or even pool of any striking dimensions occurs; but the streams that flow from the hills in the direction of Eldersfield, the Berrow, and Longdon, being precluded from reaching the Severn directly by the intervention of steep banks of marl, and having only one outlet to that river with scarcely any fall, necessarily accumulate in the flat meadows, forming *marshes* of considerable extent, and entirely overflowed in the autumnal season. Many efforts have been made to drain these marshes, and deep ditches beset them on every side; but, having only one sluggish outlet, and being, in fact, in many places below the level of the bed of the Severn, it appears impracticable to provide an adequate drainage for them. Thus these marshes present a curious appearance, hemmed in on all sides by land in the highest state of cultivation, which is continually impinging upon them. Longdon Marsh well deserves a visit to its margin, which should be made by way of Castle Morton; and the following rare or local plants which grow about, or in the wide watery ditches there, will well repay the trouble: *Hippuris vulgaris*, very plentiful; *Scirpus maritimus*, on the eastern side; *Lysimachia vulgaris*, *Lonicera Xylosteum*, on the Longdon side, by a lane leading to the northern end of the marsh; *Apium graveolens*, *Cenanthe peucedanifolia*, *C. Lachenalii*, *Triglochin palustre*, *Rumex maritimus*, *Butomus umbellatus*, *Rosa spinosissima*. In the marshy flat meadows at the end of the lane leading down from Castle Morton may be observed, before the mowing of the grass, *Lathyrus palustris*; the pretty *Cnicus pratensis*, rather plentiful; *Senecio aquaticus*, *Orchis latifolia*, *Habenaria viridis*, *Carex intermedia*, *distans*, and many others.

The extensive commons of Welland, Castle Morton, Barnard's Green, &c., have many plants that are localised there only, as *Bupleurum tenuissimum*, *Helosciadium inundatum*, *Petroselinum segetum*, *Myosurus minimus*, *Polygonum minus*, *Tormentilla reptans*, *Mentha piperita*, *Nasturtium terrestre*, *Pulicaria vulgaris*, and *Anthemis nobilis*.

The second division will comprehend the hills themselves and their immediate roots; while the third comprises the calcareous "Silurian" country westward of the hills. Cowleigh Park,\* at the northern end

\* This is truly a mountainous scene in miniature. Isolated and abrupt ridges of syenite rise up shaggy with mosses, with many a rugged oak on their sides, in the midst of a glen rendered gloomy by still higher Silurian hills, robed to their summits in wood, which shut in the view; while a musical brook, winding from amidst the limestone strata, pierces by a deep gully through the syenite, and gives an increased effect of depth and gloom.

of the chain, and including in its wild boundary several syenitic spurs, well deserves examination. Here grow *Rosa tomentosa*, *R. villosa*, *Rubus Bellardi*, *R. pallidus*, *fuscus*, and *Schlectendalii*, *R. echinatus*, *Lepidium Smithii*, and a variegated-leaved variety of *Quercus sessiliflora*. Beyond Cowleigh Park the dense covert of Rough Hill Wood offers itself to tempt the onward foot of the explorer; and in the moist meadows between that eminence and Leigh Sinton, *Hypericum Androsæmum*, *Gymnadenia conopsea*, and *Habenaria viridis*, may be gathered. The Old Storage Hill lies in this direction, and the brook that enters its secluded recesses presents many scenes of wood and water delightful both to the contemplative and botanical eye.

The rocks of the hills themselves have some plants that mostly flourish only there, such as *Galium saxatile*, *Plantago coronopus*, *Hyoscyamus niger* (Hereford Beacon), *Helosciadium repens*, *Arenaria rubra*, *Cotyledon umbilicus*, *Sedum album* (North Hill), *S. Telephium*, *Spergula nodosa*, *Potentilla argentea* and *verna*, *Orobanche major*, *Corydalis claviculata*, *Erodium maritimum* (North Hill), *Gnaphalium sylvaticum* (End Hill), and of course most of the Ferns. The Holly-Bush Hill, with the ravine called "The Gullet," between it and the Warren Hill, should, if possible, be examined; and in the bogs, which occur at the western bases of the hills, will be found the beautiful *Eriophora*, *Pinguicula vulgaris*, *Anagallis tenella*, the fly-ensnaring *Sundew*, and a plentiful supply of *Carices*.

The natural crest of the Ridgeway in Eastnor Park, splendidly wooded as it is on either side, with the grand Camp Hill towering above, is invested with interest to both geologist and botanist. Gloomy yews, of indigenous growth, in some places shadow the road; in others, the glaucous-green juniper adorns the scene; the *Polygala* shows its varying flowers of blue, pink, or white; and *Chlora perfoliata*, *Habenaria chlorantha*, *Bromus erectus*, and *Avena pubescens*, flourish on the rocky soil most luxuriantly.

Many delightful rambles may be made in the woods on the western side of the hills, or about the limestone quarries; the "Croft," in particular, towards Mathon, is a good locality. Most of the following plants may be gathered in this vicinity, being confined to the calcareous strata. *Viola hirta*, *Gentiana Amarella*, *Pimpinella magna* (Cradley and Suckley), *Chlora perfoliata*, *Chrysopenium alternifolium*, *Aquilegia vulgaris*, *Linaria minor*, *Anthyllis vulneraria*, *Vicia sylvatica*, *Cnicus eriophorus*, *Orchis pyramidalis*, *Habenaria chlorantha*, *Ophrys apifera*,

*Listera Nidus-avis*, and *Epipactis latifolia*. Wood Lyme Grass (*Elymus Europæus*) is also peculiar to the western woods.

Purlieu Lane, and some other hollow ways about Mathon and Cradley, still exhibit the old country characteristic of the roadway and the water-course existing in conjunction; and in such deep recesses *Lathræa squamaria* and other shy plants delight to hide from the glare of daylight. Here the wanderer finds himself deep in the soil, and almost floating with the stream, while thick masses of verdure, from pollard oaks and battered hollies, overspread the twilight scene; and old boles and mossy roots are covered with the untouched hoary mould of centuries, or inscribed with the curious characters the lirellæ of *Opegrapha lyncea* or *Graphis scripta* form in such places.



It has been remarked that more plants occur here varying with *white* flowers than is usual in other places; and I have observed the following plants thus sportively circumstanced: *Veronica officinalis*, *Scabiosa succisa*, *Erythræa Centaurium*, *Campanula Trachelium*, *Anagallis tenella*, *Agraphis nutans*, *Calluna vulgaris*, *Aquilegia vulgaris*, *Ajuga reptans*, *Betonica officinalis*, *Prunella vulgaris*, *Pedicularis sylvatica*, *Digitalis purpurea*, *Vicia sepium*, *Ballota foetida*, *Bartsia Odontites*, *Antirrhinum majus*, *Polygala vulgaris*, *Ononis arvensis*, *Carduus nutans*, *C. palustris*, *Orchis pyramidalis*, and *O. mascula*.

The following plants have either become very recently denizens of the Malvern district, or have been previously unrecorded in the localities where they now appear: *Veronica Buxbaumii*, *Echium vulgare*, *Erythræa pulchella*, *Cœnanthe Lachenalii*, *Sium angustifolium*, *Bupleurum rotundifolium*, *Rumex pulcher*, *Epilobium virgatum*, *Polygonum mite*, *Geum intermedium*, *Scrophularia Ehrharti*, *Orobanche minor*, *Limosella aquatica*, *Lepidium Draba*, *Barbarea præcox*, *Geranium striatum*, *Orob. tenuifolius*, *Lathyrus Aphaca*, *Lactuca Scariola*, *Hieracium umbellatum*, *Callitriche pedunculata*, *Myriophyllum alterniflorum*, *Salix acuminata*, *Juncus obtusiflorus*, *Alopecurus fulvus*, *Avena pubescens*, *Lolium multiflorum*, and *Potamogeton prælongus*.



ENUMERATION AND CENSUS OF THE MALVERN FLORA.—More than half the plants occupying the Malvern Hills are *Cryptogamic*, as will be seen by the following enumeration, which includes the productions not only of the syenitic ridges themselves, but of the country eastward to the Severn, northward to the Teme, southward to Redmarley on the Ledden, and westward to the Silurian heights parallel with Ledbury. Undoubtedly considerable additions may yet be made to the *Algæ* and *Fungi*; for I have not been able to give much attention to the *Algæ Confervoideæ*, nor have I taken but very little note of the minuter species of *Sphæria*, &c. among the *Fungi*; but I have recorded nevertheless all the really tangible and decided forms that have fallen under my observation (independent of minute microscopical examination) during a period of twenty years.

## ENUMERATION.

PHANEROGAMIC VEGETATION.	{	Dicotyledonous plants . . . . .	625	
		Monocotyledonous plants . . . . .	177	
		Total Phanerogamic . . . . .	—	802
CRYPTOGAMIC VEGETATION.	{	Ferns and Equisetaceæ . . . . .	24	
		Mosses . . . . .	145	
		Jungermannia . . . . .	28	
		Other Hepaticæ, Characeæ, &c. . . . .	28	
		Lichens . . . . .	254	
		Fungi . . . . .	398	
		Total Cryptogamic . . . . .	—	877
				<hr/>
Entire number of Malvern plants . . . . .				1679

Thus in a small tract of country, sixteen miles in length and about eight or ten in breadth, nearly seventeen hundred species of plants are found, without including minor mycological productions.



N.B. A Map of the country eight miles round Malvern, taken from the Ordnance Survey, has recently been published by H. Lamb and Son, Library, Malvern. This will be found a most useful assistance to the Geologist or Botanist, in connexion with the preceding observations.



# THE BOTANY

## OF THE

### MALVERN HILLS.



“ I come  
To this sweet place for quiet. Every tree  
And bush, and fragrant flower, and hilly path,  
And thymy mound that flings unto the winds  
Its morning incense, is my friend.”

BARRY CORNWALL.

N.B. Where the capital E. is placed after a plant, it signifies that it is confined to the eastern side of the hills; W. to the western side; H. denotes that it is limited to the hills themselves or their protruding rocks. Where no letter appears, the plant is generally distributed.

## DIVISION I.

### DICOTYLEDONOUS OR EXOGENOUS PLANTS.



#### MONANDRIA.

HIPPURIS. *H. vulgaris*. Mare's-tail. Stem from twelve to eighteen inches high, or shorter, according to the depth of water. Generally erect; but when accidentally decumbent, the leaves become curiously lengthened, flaccid, and pellucid under the water. Abundant in Longdon Marshes, near Castle Morton. E.

#### DIANDRIA.

LIGUSTRUM. *L. vulgare*. Privet. Mostly on the limestone strata. An old shrub occurs on a rock of the Herefordshire Beacon. In Brockhill Copse, Colwall, with purple foliage, enduring the whole winter.

✱ VERONICA. Speedwell and Brooklime.

*V. serpyllifolia*. Plentiful in pastures.

*V. scutellata*. In marshy spots about the hills: as at the Warren Hill; near the Wells; New Pool; bog at the western base of the Herefordshire Beacon, &c.

*V. Anagallis*. Common in the ditches of Longdon Marsh, and on the flat commons eastward of the hills.

*V. Beccabunga*. Watery ditches. Common.

*V. officinalis*. Plentiful on the hills.

*V. montana*. In "the Gullet," a woody glen watered by a brawling rill between Swinyard and Holly-Bush hills; in several of the western woods; and in damp shady spots at Alfrick, Powick, and Rushwick, St. John's.

*V. Chamædrys*. Generally dispersed. Also variety  $\beta$ . *petiolata*, with all the leaves stalked, calyx elongated, twice the length of the capsules.

*V. hederifolia*. Common on banks and arable land.

*V. agrestis*. Sepals oblong obtuse. Common.

$\beta$ . *polita*. Sepals ovate acute. Petals all blue.

*V. Buxbaumii*. An agrarian straggler. This has been gathered on Malvern Link, and near Stanbrook; but is of uncertain occurrence.

*V. arvensis*. Flowers racemose. Very common.

PINGUICULA. *P. vulgaris*. Butterwort. W. A curious plant, having a violet-like flower, with a spur behind, and corolla villous within; only found here on the bog at the western base of the Worcestershire Beacon. The leaves, flower-stalks, and calyx are densely covered with glands, producing a clammy gum that entangles and destroys the minute Tipulidæ and other insects that abound in marshy spots.

UTRICULARIA. *U. vulgaris*. Greater bladderwort. Pools. E. Rare.

LYCOPUS. *L. Europæus*. Gipsy-wort. Wet spots. E.

SALVIA. *S. verbenaca*. Wild clary or sage. Marl banks. E.

CIRCÆA. *C. lutetiana*. Enchanter's nightshade. Woody spots.

FRAXINUS. *F. excelsior*. Ash-tree. A splendid tree of this species grows in the grounds at Hope-End, Ledbury, nearly forty feet round the base. Near Barnard's Green is a narrow-leaved variety.

### TRIANDRIA.

VALERIANA. *V. dioica*. Marsh Valerian. Boggy places.

*V. officinalis*. Great Valerian. Woods.

FEDIA. *F. olitoria*. Corn-salad or lamb's lettuce.

*Fedia dentata*. Oval-fruited corn-salad. Banks.

*β. mixta*. Rough-fruited corn-salad. Capsule clothed with white incurved hairs.

MONTIA. *M. fontana*. Water-blinks. H. Often excessively minute, especially in spots where the water has dried up. Flowers small, white, half open.

## TETRANDRIA.

DIPSACUS. *D. sylvestris*. Wild teasel. Abundantly dispersed.

*D. pilosus*. Shepherd's staff. Not common. Below the Abbey, Great Malvern, and most abundant in a lane between the church and the Priory Farm at Little Malvern; in Mathon Park Copse; by the brook side under the Old Storage Hill, Alfrick, near the ruins of a paper-mill; also near a bridge on the road between Powick and the Old Hills, and at Orls Copse, Rushwick.

KNAUTIA. *K. arvensis*. Field scabious. Borders of fields.

SCABIOSA. *S. succisa*. Devil's-bit scabious. Plentiful. With white flowers in Rough Hill Wood.

GALIUM. Bed-straw.

WITH YELLOW FLOWERS. *G. cruciatum et verum*. Both common.

WITH WHITE FLOWERS. \*Fruit smooth.

*G. saxatile*. Smooth heath bed-straw. On the hills only.

*G. uliginosum*. Rough marsh bed-straw. Bogs, &c.

*G. palustre*, *α.* and *β.* The former at Longdon Marsh.

*G. erectum*. Stem hairy, panicle branched, ascending. Rare. Miss H. Moseley informs me that this uncommon *Galium* grows on the hedge on the left-hand side at the corner of the lane going up to Mr. Onslow's house (Grimsend, Alfrick) from the road from Worcester. It has been there for many years; but being almost always cut with the hedge, it can seldom be found in flower.

*G. Mollugo*. Great hedge bed-straw. Plentiful in hedges.

*G. tricorné*. Reflexed corn bed-straw. Fruit warty, reflexed. At the Croft, Mathon, as well as in dry marly fields at Hanley Castle. E. & W.

\*\* Fruit hispid. *Aparine* (Goose-grass).

ASPERULA. *A. odorata*. Sweet woodroof. Woods. W. & E. At Alfrick, on limestone, and about Cradley.

SHERARDIA. *S. arvensis*. Field Sherardia.



PLANTAGO. Plantain. *Major*, *media*, *lanceolata*, *Coronopus*, E. and H. The last (Buck's-horn plantain) is abundant on gravelly soil at Barnard's Green, the common by the Firs, walks at the Wells, Chance's Pitch, &c. It, however, grows very small.

CORNUS. *C. sanguinea*. Bloody dogwood. Plentiful.

PARIETARIA. *P. officinalis*. Wall pellitory. Little Malvern.

CENTUNCULUS. *C. minimus*. Small chaffweed. Rare. H. A very minute plant. Base of the hills near Brand Lodge.

ALCHEMILLA. *A. vulgaris*. Our Lady's mantle. Pastures.

*A. arvensis*. Arable fields, common.

SANGUISORBA. *S. officinalis*. Great Burnet. E. Plentiful in meadows by the Severn, near Tewkesbury, and at Longdon Marsh.

ILEX. *I. Aquifolium*. Holly. This beautiful evergreen abounds on the Holly-Bush Hill, southward of the Herefordshire Beacon, to which it gives name. Here are many old decayed trees, and in the thick mystic covert they form, various rare cryptogamic plants are nursed. The fine belt of hollies alluded to covers the eastern, southern, and northern declivities of the hill, below the intrenchment of the Danish camp.

SAGINA. *S. procumbens*. Prostrate pearl-wort. H. Abundant.

*S. apetala*. Short-petalled pearl-wort. Barnard's Green, &c.

*S. nodosa*. (See *Spergula*.)

MÖENCHIA. *M. erecta*. Upright Mœnchia. In profuse abundance on the hills, to the summits of the lower ridges.

## PENTANDRIA.

ECHIUM. *E. vulgare*. Viper's bugloss. A rare plant in the Malvern district, only appearing occasionally. In a field below the eastern side of the Herefordshire Beacon (Mr. G. Reece). Also on Ankerdine Hill, 1847.

PULMONARIA. *P. officinalis*. Lung-wort. Rare. By the side of a wood at Lower Sapey, near Knightsford Bridge.

LITHOSPERMUM. *L. officinale*. Common gromwell. W. and E.

*L. arvense*. Corn gromwell. Among growing wheat and barley.

SYMPHYTUM. *S. officinale*. Comfrey. Watery meadows.

BORAGO. *B. officinalis*. Borage. An agrarian wanderer.

LYCOPSIS. *L. arvensis*. Small bugloss. Road-sides.

ANCHUSA. *A. sempervirens*. Evergreen alkanet. W. In a shrubbery near Mathon Lodge. Perhaps naturalised.

MYOSOTIS. Scorpion-grass, or Forget-me-not.

*M. palustris*.\* Plentiful in watery places.

*M. cæspitosa*. On the margin of rills and pools on the grass commons. Very fine and tall by ponds near Powick. Though this plant is often taller, the flowers are much smaller than in *M. palustris*, the true "forget-me-not."

*M. sylvatica*. In woody places. Distinguished by its stiff habit and hairy foliage. Not common.

*M. arvensis*. In cultivated ground, hedge-banks, &c. A slender plant, with very small blue flowers.

*M. collina*. A small species, that appears buried in hairs, and almost invisible but for its brilliant unchangeable azure flowers rising from their bearded pedicels and bristly calyx. On some of the highest rocks of the hills.

*M. versicolor*. Raceme stalked; the upper flowers always yellow, lower ones blue. Abundant on the North and End Hills.

CYNOGLOSSUM. *C. officinale*. Hound's-tongue. Road-sides.

*C. sylvaticum*. Green-leaved hound's-tongue. E. Rare. The calyx of this species is bright green, with a few hairs, while that of *officinale* is always hoary. At the eastern base of Warren Hill, near the Gullet. Also by the side of the road south of Longdon Church.

ANAGALLIS. *A. arvensis*. Scarlet pimpernel. General.

*A. cærulea*. Blue pimpernel. In cornfields by the Croft lime-works, with M. Moggridge, Esq., in 1841. The extreme beauty of the blue pimpernel makes me unwilling to merge it in *A. arvensis*, though perhaps derivable from the latter. Indeed, some years ago, when Honorary Curator of the Worcestershire Natural History Society, a member brought me to the museum both blue and white flowered varieties, which he had gathered growing with the red in a field at Astley, near Stourport.

*A. tenella*. Bog pimpernel. Abundant in the bog at the western base of the Worcestershire Beacon. An exquisite floral gem.

\* This exquisitely delicate and beautiful flower has become sacred to love and friendship throughout Europe; and, abundant as it is, it may deserve the distinction, as keeping its symbolic azure eye still open at noon or eve when once unfolded in the cool spots where it revels, and not uncertainly shutting up its petals at the withdrawal of the solar rays, like many other flowers. The racemes are many-flowered, their peduncles as well as the pedicels and calyces thickly covered with close appressed white bristles. The flowers are of an enamelled azure, though pale purple before expansion, with white ribs at the base, where five brilliant yellow nectaries form a golden star, within which the stamens and pistil are carefully sheltered.

LYSIMACHIA. *L. vulgaris*. Yellow loose-strife. Longdon Marshes ; also by the Weir at Powick Bridge on the Teme, and at Bransford Mill.

*L. nemorum*. Wood pimpernel. *L. Nummularia*. Money-wort.

PRIMULA. *P. vulgaris*. Primrose. Also var. *β. caulescens*, with flowers of varying depths of tint. Both with scape and cal. villose.

*P. veris*. Cowslip. In open meadows, while the primrose mostly grows on banks and in woods. Very rarely a cowslip-oxlip, var. *β. elatior*, occurs, but *not as a distinct race*. Such I have gathered at Bransford.

HOTTONIA. *H. palustris*. Water violet. At Forthampton, south of Longdon, in a ditch near Mr. Yorke's, Forthampton Court ; also near the turnpike-gate on the Malvern side of Upton, 1851 (Mr. Kent).

ERYTHRÆA. *E. Centaurium*. Centaury. General.

*E. pulchella*. Gathered by Mr. G. Reece on the side of a lane between Alfrick Chapel and Grimsend House. It agrees precisely with littoral specimens. Also near Malvern (Mr. T. Westcombe).

HYOSCYAMUS. *H. niger*. Henbane. On waste ground at the Wells, and the base of the Herefordshire Beacon. Not common.

✱ SOLANUM. *S. Dulcamara*. Woody nightshade. Hedges.

*S. nigrum*. Garden nightshade. Hanley.

VERBASCUM. *V. Thapsus*. Great mullein. On the hills. The dense spike of yellow flowers of this plant, with its thick flannel leaves, forms a very conspicuous object in the Malvern Flora.

*V. Blattaria*. Moth mullein. Occasionally by road-sides.

*V. virgatum* formerly grew at Bevereye, near Worcester, and appeared at Perdiswell in the same vicinity in 1851, as the Rev. J. H. Thompson has informed me. *V. Lychnitis* (white mullein) has been gathered by Captain Gordon at Apperley, near Tewkesbury, and may enter this district.

CONVOLVULUS. *C. arvensis*. Small bindweed. *C. sepium*. Great hedge bindweed.

VINCA. *V. minor*. Lesser periwinkle. Rare. In a wood at the western base of the Keysend Hill ; among underwood in the copse above the lime-kilns at Leigh Sinton ; also in a lane between Powick and Bransford, at Alfrick, and other localities.

*V. major*. In a lane near Welland Common ; in the parish of Powick, and other places ; but always in a naturalised state.

JASIONE. *J. montana*. Sheep's-bit scabious. Rare in this district. On a mass of rock near Whippet's Brook, Cowleigh ; also at Rosebury Rock, Knightwick.

SAMOLUS. *S. Valerandi*. White-flowered brookweed. E. Rare.

CAMPANULA.\* Bell-flower. *C. rotundifolia*. Common. H.

*C. patula*. Spreading bell-flower. A delicate and rather rare plant. It may always be found under the hedges of the lane between Barnard's Green and Maddresfield, turning off by the old elm. Also at Hanley, and in a lane near the Rhydd. It does not occur on the calcareous strata westward.

*C. Rapunculus*. Rampion. Near Bromsberrow. Rare.

*C. latifolia*. Giant bell-flower. Formerly in coppices (now cut down) beyond the Chalybeate Spa; and a few straggling plants yet remain under hedges in that vicinity. Also on the banks of Laughern Brook, Boughton, near Worcester.

*C. Trachelium*. Canterbury bells. Common by road-sides. With white flowers in a lane near the Raggedstone Hill.

LONICERA. *L. Periclymenum*. Common honeysuckle.

*L. Xylostium*. Fly honeysuckle. Rare. On the eastern side of Longdon Marsh, and at Powick, in a hedge close to the northern entrance into the churchyard. This is a very local plant, but it appears to be really wild in both the above-mentioned localities.

RHAMNUS. *R. catharticus*. Buckthorn. In hedges near Maddresfield, and below Malvern Wells; banks of Laughern Brook.

EUONYMUS. *E. Europæus*. Spindle-tree. In hedges. In autumn the pink capsules, when half open and displaying the rich orange-coloured *arillus*, make a brilliant show. E. and W.

VIOLA. *V. hirta*. Hairy violet. Generally dispersed, but most abundant on the Silurian strata; Holly-Bush Hill, and in profusion on the banks of old quarries about Chance's Pitch, and near Ledbury; also at Powick.

*V. odorata*. Sweet violet. Abundant on hedge-banks in secluded lanes, both with white and purple flowers. The beardless var. (*imberbis* of Leighton) is as common as the bearded form.

*V. canina* (*sylvatica* of Fries and Babington). Dog-violet. In woods and their borders.

*V. pumila*. Small dog-violet. What I formerly called "flavicornis," now referred to this, grows upon the hills in various spots on the turf; but it has become difficult to determine a violet, or rather to prevent technical botanists from altering the names of plants.

\* When the capsule ripens, three pores at its base, previously closed by lids, gradually open, allowing egress to the seeds from the interior; and these are then so dry, that they easily wriggle themselves out, although the calyx is reflex, while the slightest shaking of the stem scatters them on all sides. *C. latifolia* exhibits this best.

*V. tricolor*. Three-coloured violet. Not uncommon. In considerable plenty on the side of the new Wych Road; also a var. with ovate crenate leaves, and entirely purple flower.

*V. arvensis*. Field violet. Common in arable fields.

RIBES. *R. rubrum* and *R. nigrum*. Dubious if wild. The former occurs as an epiphyte on the lime-trees in Ledbury churchyard; the latter I have found near the Gullet, and on the banks of the Teme. *R. rubrum* occurs plentifully on the side of a brook at Maddresfield, near to where the footpath crosses it from Powick and Kent's Green.

*R. grossularia*. Gooseberry. Often epiphytical on old trees.

HEDERA. *H. Helix*. Ivy. Covering the Ivyscar rock most luxuriantly; on Little Malvern Priory, &c.

GENTIANA. *G. Amarella*. Autumnal gentian. Not common in general; it is, however, abundant on calcareous soil on the western side of the hills, as near Purlieu Lane, below the Wych; at Sarnhill; also on the side of Mill Copse, Cowleigh.

CUSCUTA. *C. Europæa*. Greater Dodder. Among vetches, at the Berrow; and at Cotheridge. Rare. I have also seen it on beans, in which case there is little or no produce. In 1840, in company with Jabez Allies, Esq., I observed a large portion of a field of vetches completely prostrate under the weight of this stringy parasite, often vulgarly termed "Devil's Guts." It is, however, of uncertain occurrence. Growing among nettles on the eastern side of Welland Common.

### UMBELLIFERÆ.

HYDROCOTYLE. *H. vulgaris*. Marsh penny-wort. H.

SANICULA. *S. Europæa*. Wood sanicle. In woods.

APIUM. *A. graveolens*. Wild celery. In ditches at Longdon Marsh and Pendock Portway. Also in a ditch near Cotheridge. E.

PETROSELINUM. *P. segetum*. Corn parsley. On a marly headland extending eastward from Castle Morton Church, and at Broadwas.

HELOSCIADIUM. *H. nodiflorum*. Procumbent marsh-wort.

*H. repens*. Creeping marsh-wort. This species abounds in the prills that run down the syenite, where it fully preserves its character as the smallest British umbelliferous plant.

*H. inundatum*. Narrow-leaved marsh-wort. This is very distinct, and occurs in deep stagnant water-holes by the brook on Welland Common. On Newland and Barnard's Greens (Mr. Westcombe).

SISON. *S. Amomum*. Hedge-stone parsley. In shady lanes.

ÆGOPodium. *Æ. Podagraria*. Gout-weed. Banks of Teme, &c.



BUNIAM. *B. flexuosum*. Pig-nut. Pastures.

PIMPINELLA. *P. Saxifraga*. Burnet saxifrage. Plentiful.

*P. magna*. Greater burnet saxifrage. Rare. About Cradley. W.

SIUM. *S. angustifolium*. Narrow-leaved water parsnip. Rare. At Lower Wick, Powick (Mr. G. Reece); in a ditch near Teme's Mouth (Mr. T. Baxter).

BUPLEURUM. *B. tenuissimum*. Slender-leaved hare's-ear. Plentiful on the common by the road-side, just beyond Garford Court, Barnard's Green, two miles below Great Malvern Church, where it was first indicated to me by my acute and learned friend, Dr. Addison. I have also found this rare and curious plant on a gravelly part of Welland Common, near the Rookery.

*B. rotundifolium*. Round-leaved hare's-ear. In a field at the top of Folly Copse, Alfrick, 1849 (Miss Moseley). Rare in the district.

CENANTHE. *Æ. fistulosa*. Common water dropwort. E.

*Æ. pimpinelloides*. Knotty-rooted water dropwort. Root of numerous long fibres, bearing round or ovate scaly tubercles towards their extremities; radical leaflets, horizontal, bi-pinnate; pinnulæ wedge-shaped, segments of the upper leaves linear and acute; umbels with 6-14 rays, umbellules dense, many-flowered, external florets on long pedicels; fruit cylindrical, its base callous and incrassated, crowned with the straight styles divergent at the apex. In a large dry broomy pasture at Maddresfield; in many upland marly meadows at Powick, especially near Brook House, and along the meadows by the side of the brook from the Upton road nearly to the Severn; in fields at Forthampton plentiful. From the crown of the old root an offshoot is produced the second year, new fibres and bulbs are thrown out, and the plant thus multiplied.

*Æ. Lachenalii*. Parsley-water dropwort. Root of slender fleshy fusiform tubercles, gradually thickened at the middle; radical leaflets pinnate, with broadly-lanceolate blunt pinnæ; lower stem-leaves bi-pinnate, upper pinnate, the pinnæ linear-lanceolate, general involucre of 6-8 linear leaflets, umbels of 5-16 rays, umbellules of numerous florets; external barren on long pedicels, internal crowded, almost sessile; fruit invariably conical, with thin prominent ribs, not callous at the base. In the Welland Marshes; also in Longdon Marsh.

*Æ. silaifolia*. Sulphur-wort dropwort. Root of elliptical or pyriform thick sessile tubercles; radical leaves bi-pinnate, with linear lanceolate pinnæ, similar to those of the stem; umbels with 3-8 rays, small; fruit oblong, contracted below the base, callous but not enlarged. Rare.

Longdon Marsh, and in ditches at Castle Morton; on Kempsey and Tewkesbury Severn Hams. This is *Æ. peucedanifolia* (Smith), and perhaps not really *Æ. silaiifolia* of Bieberstein.

*Æ. Phellandrium*. Cut-leaved dropwort. In stagnant pools about the Chase. Not uncommon. In a small pool on Powick Ham.

*Æ. crocata*. Hemlock water dropwort. In ditches of the Chalybeate Coppice (destroyed 1850). Towards Barnard's Green, and Bransford Weir on the Teme.

*ÆTHUSA*. *Æ. Cynapium*. Fool's parsley.

*SILAUS*. *S. pratensis*. Meadow pepper-saxifrage. Fields.

*ANGELICA*. *A. sylvestris*. Wood Angelica. Wet spots.

*PASTINACA*. *P. sativa*. Common parsnip. On the red marl.

*HERACLEUM*. *H. Sphondylium*. Cow parsnip. Meadows, common.

*DAUCUS*. *D. Carota*. Wild carrot. Mostly W. In abundance.

*TORILIS*. *T. infesta*. Hedge parsley. E. In corn-fields.

*T. nodosa*. Knotted hedge parsley. Not very plentiful.

*T. Anthriscus*. Upright hedge parsley. In coppices and hedges.

*SCANDIX*. *S. Pecten*. Venus's comb. Corn-fields.

*ANTHRISCUS*. *A. sylvestris*. Wood beaked parsley.

*A. vulgaris*. Common beaked parsley.

*CHÆROPHYLLUM*. *C. temulentum*. Rough chervil.

*CONIUM*. *C. maculatum*. Hemlock. Rampant on hedge-banks.

*SMYRNIUM*. *S. Olusatrum*. Alexanders. Red marl. E. Scarce.

*CHENOPODIUM*. Goose-foot. *C. polyspermum*, *Bonus - Henricus*, *urbicum*, *rubrum*, *album*. Also *C. album* *β. viride*.

*ULMUS*. *U. campestris* (*suberosa*, Hook.). Common elm. Abundant in hedges. A very old and tempest-battered tree of this species stands on Barnard's Green, which forms a picturesque object. Its bole is twenty-four feet in circumference. *β. major*, at Rushwick.

*U. montana*. Wych hazel. In woods. Often very grotesque.

*VIBURNUM*. *V. Lantana*. Mealy guelder rose. Near Ripple, and about Ledbury.

*V. Opulus*. Common guelder rose. Watery places.

*SAMBUCUS*. *S. Ebulus*. Danewort. Stem herbaceous, leaflets lanceolate, cyme large, purplish, berries black, mostly abortive. Rare. By the side of a lane connecting Birtsmorton with the Ledbury road. Also in a hedge by the road-side at Wick, between Powick Bridge and Boughton's Nursery, not far from the latter. This species of elder is said generally to flourish where human blood has been spilt; and skirmishes occurred in the Civil Wars near both the above spots.

*S. nigra*. Common elder. Abundant on the declivities of the Rabbit-warren, Herefordshire Beacon, where old trees are often wreathed with the odd-looking brown *Exidium Auricula-Judæ*. *β. purpurea*, with the exterior of the petals tinged with purple, grows on the eastern side of Raggedstone Hill.

LINUM. *L. usitatissimum*. Common flax. Occasional.

*L. catharticum*. Purging flax. Extremely common.

DROSERA. *D. rotundifolia*. Round-leaved sundew. In the bog at the western base of the Worcestershire Beacon. Ensnaring insects in the viscous globules formed on the red setæ covering the upper surface of the leaves.

MYOSURUS. *M. minimus*. Little mouse-tail. E. Rare.

## HEXANDRIA.

BERBERIS. *B. vulgaris*. Barberry. Near Leigh Sinton (Mr. Westcombe), but of rare occurrence in this district. In Cowmore Lane, St. John's, Worcester.

PEPLIS. *P. Portula*. Water Purslane. Welland Common.

RUMEX. *Dock and Sorrel*.

DOCKS.—*R. maritimus* (Longdon Marsh), *palustris* (Forthampton and Severn Stoke), *conglomeratus*, *pratensis* (Longdon), *obtusifolius*, *Hydrolapathum* (Longdon), *crispus*, *pulcher* (near Longdon), *sanguineus*. The last only, as far as I have seen, in the form *β. viridis*. *R. pulcher* is very rare, and is admitted on Mr. T. Westcombe's undoubted authority. *R. Hydrolapathum* grows fine in pools near the Severn.

SORRELS.—*R. acetosa* and *Acetosella*. Both abundant; the latter with red foliage on the hills.

## OCTANDRIA.

ACER. *A. campestre*. Common maple. A prevalent tree.

CHLORA. *C. perfoliata*. Yellow wort. E. and W. Mostly on lime, as at the Croft, Mathon, Leigh Sinton, and the calcareous strata on Cowleigh Farm; also at the Rhydd, and Bush Hill, Powick.

CALLUNA. *C. vulgaris*. Common heath or ling. Grows very dwarf.

N.B. No species of *Erica* occurs throughout the chain.

VACCINIUM. *V. Myrtillus*. Bilberry. On some eastern rocks of the Worcestershire Beacon, and in woods north of the End Hill.

EPILOBIUM. Willow-herb. *E. angustifolium*. Rose-bay willow-herb. Rare. On the northern border of Welland Common, in a hedge close to Lumber-tree Bank.

*E. hirsutum*. "Codlings and cream" (so called from its scent). Common in watery ditches.

*E. parviflorum*. On the margin of rills on Castle Morton and Welland Commons. In this species the very hairy calyx equals the petals in length, which seldom fully expand.

*E. montanum*. By springs and wet plashy spots.

*E. roseum*. Rather local. Near Barnard's Green, gathered by my observant friend the Rev. A. Bloxam. Also in the lane by "the Devil's Oak." Found by the Rev. J. H. Thompson at Bransford Bridge Mill. This and the following have their clavate stigmas undivided.

*E. tetragonum*. Watery places. Common.

*E. virgatum*. Intermediate between tetragonum and the following. Gathered by Mr. Westcombe.

*E. palustre*. Leaves narrow, lanceolate, sessile; stem round, almost smooth; root with filiform scions; flowers small. Sides of watery ditches.

DAPHNE. *D. Laureola*. Spurge laurel. Woods.

POLYGONUM. Bistort, Knot-grass, and Persicaria. *Bistorta* (abundant in a field bordering on the Chalybeate Pool), *aviculare*, *Convolvulus*, *dumetorum* (scarce), *amphibium*, *Persicaria*, *lapathifolium*, *Hydropiper*, *minus*. The last is rare, and only occurs in damp depressions of the wet commons eastward, as below the Firs, and on Welland Common. *P. mite* has been gathered at Boughton, near Powick.

ADOXA. *A. Moschatellina*. Tuberous Moschatell. Rare. E. and W. By the side of the brook that runs at the base of the Old Storage, and on the bank of the Teme between Leigh Church and Bransford Bridge. An early adornment of the pretty winding Laughern Brook, near Worcester. Also under hedges in the parish of Mathon.

## DECANDRIA.

SCLERANTHUS. *S. annuus*. Annual knawel. H.

CHRYSOSPLENIUM. *C. alternifolium*. Alternate-leaved golden saxifrage. At the bottom of Purlieu Lane, a curious old holloway road, forming the water-course of a brook for a portion of its length, and communicating between the Wych and the Mathon road. Side of Whippet's Brook, in the wood west of Cowleigh Park. On the banks of the brook above Bridges Stone Mill, &c.

*C. oppositifolium*. Opposite-leaved golden saxifrage. Common by springs all over the hills, and in the woods.

SAXIFRAGA. *S. granulata*. White meadow saxifrage. End Hill.

*S. tridactylites*. Rue-leaved saxifrage. Little Malvern. On Newland Chapel-roof and Powick Old Bridge. Also on a wall at Cowleigh Farm-house.

SAPONARIA. *S. officinalis*. Common soapwort. Between Worcester and Cotheridge, not far from Mudwall Mill. Banks of Severn. In a field near Cowleigh Farm-house, but naturalised. Hedges near Hanley (Ballard).

DIANTHUS. *D. Armeria*. Deptford pink. In pastures below the Abbey Church; but rare. Near Powick (T. Westcombe).

*D. barbatus*. Bearded pink or sweet William. Naturalised in the little wood at the Wells for many years.

N.B. *D. prolifer* (proliferous pink) is stated in Dr. Withering's *Botany* to have been found in a marl-pit on Lindridge Hill, Hanley Castle, by the late Mr. Ballard, surgeon of that place; but several botanical friends, as well as myself, have searched for it there in vain.

SILENE. *S. inflata*. Bladder champion. Borders of fields.

STELLARIA. *S. media*, common chickweed; *S. holostea*, greater stitchwort; *S. graminea*, lesser stitchwort; *S. glauca*, glaucous marsh stitchwort; *S. uliginosa*, bog stitchwort.

ARENARIA. Sandwort; *A. trinervis*, *serpyllifolia*, *tenuifolia*.

SPERGULARIA. *S. rubra*. Red sandwort Spurry. (*Lepigonum rubrum*, Wahl. and Bab.). Very common on the walks of the hills, but expanding its bright petals only while the sun shines.

COTYLEDON. *C. Umbilicus*. Wall pennywort. Leaves peltate, depressed in the centre, on long stalks, very fleshy. Flowers cream-coloured, pendulous. In crevices of the rocks. Flowering till November.

SEDUM. *S. Telephium*. Live-long, or midsummer-men. On the Ivyscar and other rocks of the North Hill; Beech-wood at Malvern Wells; in a field below West Malvern Church; and in a field behind the Norris Farm, Leigh, plentiful. The var. *β. purpureum* grows in a field close to Laughern Brook, Bubble Bridge, Worcester.

*S. album*. White stonecrop. Leaves cylindrical, obtuse, glaucous green, often bright red. On the most precipitous rocks of the North Hill, but very seldom flowering. This has a different aspect to the garden *album*, and is the *S. teretifolium*, Haworth. It is certainly indigenous on the Malvern rocks.

*S. acre*. Wall pepper. *S. reflexum*. Crooked stonecrop.

OXALIS. *O. Acetosella*. Wood sorrel. Hills and woods.

AGROSTEMMA. *A. Githago*. Corn cockle. In corn-fields.



✓ **LYCHNIS.** *L. Flos-cuculi.* Ragged Lychnis. Wet pastures.  
*L. vespertina.* White campion. Under hedges. Common.  
*L. diurna.* Red campion. Generally diffused about coppices. A more elegant plant than the preceding. Teeth of the globose capsule recurved. Sometimes with pale flowers.

**CERASTIUM.** *C. vulgatum.* Broad-leaved mouse-ear chickweed.  
*C. viscosum,* and *C. semidecandrum.*

**MALACHIUM.** *M. aquaticum.* Water chickweed. In wet spots. Not very uncommon.

**SPERGULA.** *S. arvensis.* Corn spurrey. Borders of fields.  
*S. nodosa.* Knotted spurrey. On the edges of various springs on the sides of the hills, especially the western descent of the Worcester-shire Beacon. Also on Welland Common.  
*S. subulata.* Glandular-fringed spurrey. In dry gravelly spots.

### DODECANDRIA.

**LYTHRUM.** *L. Salicaria.* Purple Loosestrife. Sides of water.  
**AGRIMONIA.** *A. Eupatoria.* Agrimony. Common.  
**RESEDA.** *R. Luteola.* Common dyer's rocket. Abundant.  
*R. lutea.* Yellow rocket. Recorded by Dr. Addison, F.L.S., but it must be *very rare* here, for I have failed ever to observe it myself.

### ICOSANDRIA.

**PRUNUS.** *P. insititia.* Wild bullace. In hedges about Barnard's Green and Welland Common.

*P. spinosa.* Black-thorn. Common.

**CERASUS.** *C. avium.* Common bird's cherry. Abundant in most of the hilly woods. A very large tree with drooping branches occurs on the edge of a wood at the bottom of Purlieu Lane.

*C. austera.* Austere wild cherry. Chiefly differs from the former in the leaves not drooping, and the calyx tube scarcely contracted beneath the sepals. Hedges, Barnard's Green. Rare.

**CRATEGUS.** *C. Oxyacantha.* Hawthorn. On many of the hills in a dwarf contorted state, and often very old.

**PYRUS.** Pear, Apple, and Service.

*P. communis.* Wild pear. Scattered sparingly in woods. At Alfrick there is a coppice called the Thorny-Pear Coppice, from the numerous wild pear-trees within it.

*P. Malus.* Crab. In hedge-rows and coppices.

*P. aucuparia.* Mountain ash. In the woods about Mathon and

Cradley, but sparingly. Planted on the hill-side at Great Malvern and the Wells.

*P. torminalis*. Some large old flowering trees occur in Hawthorn Lane, Maddresfield, and on Bush Hill, Powick. In woods. E. and W.

At Monkfield Farm, Newland, close to the Worcester Road, is an orchard of Barland pear-trees, perhaps unequalled in the world. There are more than seventy lofty trees; and in "a hit," as it is called, the produce has amounted to two hundred hogsheads. It has been stated of a hop-yard, that in particular years the value of the produce would be equal to the fee-simple of the land occupied by the plant; and almost the same might occur with a fine perry-orchard. The one in question occupies five or six acres, and the price of perry varies from 6*d.* to 1*s.* 6*d.* a gallon. Now, supposing the average price of 3*l.* per hogshead to be obtained in "the hit" year of two hundred, the perry produced would be worth 600*l.*! However, against this flattering picture must be placed the fact that in a year of failure this same orchard has borne fruit that only supplied *three* hogsheads. The trees are now becoming old, and will never probably be so fruitful as formerly. Opposite is a very fine apple-orchard containing about 400 trees.

*SPIRÆA*. *S. Filipendula*. Dropwort. On the Old Hills, gentle eminences of red marl covered with turf, about two miles eastward of Maddresfield. Also plentiful in a waste field next the lane on entering Maddresfield from Powick.

*S. Ulmaria*. Meadow-sweet. Common. I once found *S. salicifolia* in a ditch near Hunter's Hall, Welland Common.

*ROSA*. *Rose*. This beautiful family profusely adorns the richly-diversified country about the Malvern Hills, especially on the borders of thickets. Probably so many species or varieties are not to be found within the same space in any other part of England. They therefore deserve particular attention, flowering as they do at a time when all sweet things put on their fairest aspect.

" The time will bring on Summer,  
When briars shall have leaves as well as thorns,  
And be as sweet as sharp."

SHAKSPEARE.

### I. SETIGEROUS ROSES.

*R. spinosissima*. Spinous burnet-leaved rose. This very characteristic species occurs on the calcareous strata by the road-side at Leigh Sinton, and also near Bransford Chapel.

*R. Doniana*.\* Don's spinous rose. Flowers beautifully mottled, red and white. Side of a wood near Cradley. Also near Alfrick. Very uncommon.

## II. NON-SETIGEROUS ROSES.

\* *With scented foliage.*

*a.* The leaves turpentine-scented.

*R. villosa*. Villous rose. Not uncommon, distinguished by its very woolly leaves, rather dwarf growth, and deep red flowers. Rough Hill Wood, the Croft, the Wells, Little Malvern, Colwall. *R. Sherardi* (Smith), a variety of this with falcate prickles, occurs at Little Malvern and Powick.

*R. tomentosa*. Downy-leaved rose. Leaves less clothly than the preceding, and a loftier-growing shrub. In hedges below Great Malvern, and towards Welland. Also in Cowleigh Park and borders of woods towards Cradley. Plentiful between Maddresfield and Powick. *R. scabriuscula* is a variety of this, with the ribs of the leaflets only hairy and glandular. About Cowleigh and Cradley.

*R. inodora*. Slightly-scented briar. Leaflets elliptical acute, doubly serrated, closely and minutely hairy above, woolly beneath, with prominent ribs. The scent in this species is scarcely perceptible, but when there is any it is resinous, which shows its affinity with *R. tomentosa*. Bushy pastures below Malvern Wells, &c.

*b.* The leaves sweet-scented.

*R. micrantha*. Small-flowered sweet briar. "Its smaller and paler flowers, and arched straggling shoots, distinguish it from *R. rubiginosa* at first sight."—SIR W. J. HOOKER. Generally occurs on the limestone strata, at Old Castle Bank, Ledbury-road, and by old quarries. Also in bushy fields about Malvern Wells. The flowers are sometimes exceedingly minute.

*R. rubiginosa*. Common sweet briar. A very rough variety, which I term *β. aspera*, often grows up in hedges, having a very different general aspect to the garden sweet briar, and with larger leaves, but still retaining the scent. Generally dispersed.

*R. sepium*. Bushy sweet briar. Rare. At Little Malvern, in a hedge between the Priory and the Farm, where I have noticed it for many years. The foliage is broad, sweet-scented, hairy, the petioles and cal. segments are glandulose, peduncles setose, and fruit naked.

\* This seems generally considered by botanists now as a variety of *R. Sabini*. But I think the name may be well retained, as the two plants do not appear to grow intermixed. At all events, I sent the present rose to the late Mr. Sabine, at his request, for the Horticultural Garden, and he considered it *R. Doniana*.

*R. sarmentacea*. Long-trailing briar. This is generally included among the varieties of *R. canina*; but when in perfection, its sharp doubly-serrated leaflets, and calyx-segments fringed with glands, well distinguish it from the common forms of that species. Besides, its foliage, when fresh and young, is *sweet-scented*, not the case in *R. canina*. On and about Rough Hill, near Cowleigh Park, and its vicinity, but not very general.

\* \* *With scentless foliage.*

*a.* Styles distinct, included, or nearly so.

*R. canina*. Common dog-rose. Leaflets naked, carinate, serratures simple. Abundantly dispersed. It is remarkable that the flowers of this common form are more *odorous* than any other wild British rose.

*R. glaucophylla*. Glaucous-leaved rose. Leaves flat, naked on both sides, of a peculiar glaucous hue, sharply and doubly serrated; calyx-segments pinnate, elongated, clothed as well as the calyx-tube and peduncle, with abundant setæ. This may be the "*hispida*" of Desv. Journ. Bot., and with its densely setose fruit and peduncles, has a very different aspect to the common form of *canina*. Forming large bushes bordering a wood by the road-side near the Cradley turnpike.

*R. surculosa*. Fastigate-flowered rose. Another relation to *R. canina*, from which it is distinguished by the hairy midribs of its leaflets and petioles, but principally by its numerous cymes of flowers (often five to twelve in a cluster), the surculi bearing which are beautifully blue or purple, and the almost simple calyx-segments. On the side of a lane leading from Welland Common to Castle Morton and Longdon.

*R. dumetorum*. Thicket rose. Leaflets hairy on both sides, with elongated calyx-segments. In hedges, about Great Malvern and Madresfield.

*R. Forsteri*. Forster's rose. Leaflets always hairy beneath, generally small, as well as the flowers. Rather plentiful.

*b.* Styles united in a column, exserted.

*R. systyla*. Close-styled dog-rose. Rather rare, though possibly often passed over for *R. canina*, as the exserted styles are not very prominent till the petals drop off. It cannot then be mistaken. Peduncle always slightly glandulose. Among the underwood in the copse at the back of the Wells House; in a hedge between Little Malvern Priory Farm and Welland Common; also in Cowleigh Park, and at Powick. Pye's Nest, near Ledbury.

*R. arvensis*. Trailing field-rose. Plentifully distributed. The

glaucous-purple hue of the shoots, and the peculiar, scarcely agreeable scent of this rose renders it well known and distinguishable to the most common observer.

**RUBUS.** *Raspberry and Bramble.* This intricate tribe has of late years received much attention from Mr. Borrer and Dr. Lindley; and more recently still Mr. Leighton, Dr. Bell Salter, the Rev. Andrew Bloxam, and Mr. Babington, have closely investigated the subject, and all published their ideas in monographs or fasciculi of specimens, so that the British Rubi are now much better looked after than formerly, and may be examined with some hope of being understood. As I have myself, to use a simile of Dr. Lindley's, I hope as "a fair sportsman," struck down some game in the same field, I must use my right to dress up the spoils after my own fashion: but whether the varied forms of Rubi are studied or not, the experience of all will probably show Dr. Walcott to be correct when he says—

"In our journey through life, my dear Joan, I suppose,  
We shall oft meet a *Bramble*, and sometimes a *Rose*."

*A. Fruticose brambles, arched and rooting at the extremity.*  
*Subperennial.*

i. RUBI CÆSII. Barren stem pruinose, with unequal prickles, generally with few setæ, prostrate unless supported.

*R. cæsius*, Linn. Stem glaucous, round, prickles slender, leaves mostly ternate, flexible and naked, panicle simple glandular, fruit glaucous, with the sepals inflexed. In low shady places.

Numerous varieties occur, more or less stout, according to exposure, one of the most remarkable is my *nudatus* (Steele's *Handbook*), in which the glands are obliterated. Another, the var. *Pseudo-Idæus* of Rub. Germ. has its foliage pinnate like the raspberry, with a stout erect stem. This grows at Rushwick near Worcester.

*R. dumetorum*, W. and N. Stem angular, setose, prickles numerous, unequal: leaves quinate, coriaceous, downy beneath; panicle branched, setose; calyx involute on the fruit. In hedges.

Many varieties occur, difficult to discriminate, the only unvarying characteristic form being the "ferox" of Rub. Germ., which is very stout, large, and prickly.

*R. Wahlbergii*, Arrh. Stem angular, excessively armed with unequal prickles and setæ; leaves pedate-quinate, with overlapping leaflets, hairy on both sides; panicle branched, long, leafy and setose; sepals patent glandular; "drupes glaucous with silky hairs." Banks of Leigh Brook near Bridges-Stone Mill.



*R. sublustris*. Stem angular, smooth (setæ rare), with distant prickles; leaves quinate, smooth above, green with soft pubescence beneath, last pair of leaflets sessile, overlapping; panicle corymbose, downy, leafy below; sepals reflex in fruit. Hedges in the low country.

This is the "corylifolius" of Smith, confounded by Weihe and Nees with their *dumetorum*. The flowers are generally white, appearing early, but some varieties have them purple; in others the leaves assume a monstrous aspect, the central leaflet divided. The most remarkable deviation from the type is my var. *cœnosus* (Steele's *Handbook*), in which the stem is hairy, covered with sessile white glands, and thus often *begrimed with dust*; the panicle much branched, with numerous pale glands, and downy corymbose branches.

ii. RUBI GLANDULOSI. Barren stem arching or procumbent, more or less covered with aciculi and setæ.

*R. tenui-armatus*, Lees. Stem angular, sparingly setose; prickles scattered, slender, very weak, nearly equal; leaves pedate or quinate, the lowest pair of leaflets sessile, central one ovate or cordate-ovate, acuminate, all sharply serrate, downy or glaucous beneath; panicle with distant leafy branches, hairy and armed with long descending weak prickles, many setæ, and a few pale aciculi, crowded at the summit; the sepals tomentose, patent after flowering. In hedges and thickets about Great Malvern.

This characteristic species has been confounded with the dubious *R. Schleicheri* of Rub. Germ., but is certainly not the *Schleicheri* of Leighton's *Fascic.*, neither, I think, of W. and N. It approaches some varieties of *dumetorum*, but may always be distinguished by its weak prickles, that are broken at the slightest touch, its involute sepals, and scattered leafy panicle.

*R. Guntheri*, W. and N. Stem prostrate, angular, clothed with long hairs and numerous setæ, aciculi, and slender prickles; leaves ternate, quaternate, and quinate, smooth above, pilose beneath, the central leaflet obovate acuminate; panicle narrow, flexuous, subracemose, hairy and glandular, with few weak prickles; petals narrow; sepals elongated, closely reflex in fruit. Crow's-nest Wood in profusion, but a local species.

*R. Bellardi*, W. and N. Stem procumbent, closely hairy and setose; prickles small, weak, and numerous; leaves mostly ternate, with pale, prominent, ciliated ribs beneath; panicle closely hairy, with short aciculi, longer setæ, and weak deflexed prickles; its lower branches distant leafy, crowded at the summit; the sepals patent about the half-

ripe fruit. In Rough Hill Wood to the summit. Also in woods on the Old Storage, and near Cradley.

*R. Lejeunei*, W. and N. Stem angular, armed with unequal prickles, with few setæ, passing into pale, weak aciculi; leaves ternate, quaternate, and quinate, often large; if ternate, the lateral lobes large, bulging towards the stem, the central one widely separate, ovate, and sharply doubly-serrate, all hairy above and downy on the ribs beneath; panicle with three or four spreading, axillary, leafy, corymbose branches, and about the same number of upper short ones, the whole much divaricated and bending when in fruit, covered with soft hairs, setæ, and aciculi, most numerous towards the summit; calyces woolly, setose, and prickly; loosely reflex in fruit. Plentiful in a dingle at the north side of Rough Hill.

The long lower branches spreading almost at right angles, and forming a singularly wide panicle, give this plant a peculiar aspect, especially when pendent in fruit. It probably osculates with *R. rosaceus*.

*R. pallidus*, W. and N. Stem angular, trailing, armed with distant prickles, copiously fringed with stellate hairs, setæ, and aciculi, forming an hispid fringe surrounding the stem on all sides; leaves ternate or quinate, the leaflets elliptical, central one slightly obovate, narrowed at the base, with a long cusp, all bright green above, pallid beneath; panicle broad, hairy, and setose, with long pale prickles, and distant, corymbose, leafy branches. In Cowleigh Park plentiful.

*β. Hystrix*. Stem thicker, but otherwise similar; the leaves larger, all quinate with coarser serratures, pale green, and never canescent; rachis more hairy than the barren stem, and fringed with glands and aciculi; panicle very long, its lower branches very distant, leafy, and corymbose, gradually shortening and approximating to the summit. In the same thickets with *pallidus*.

*Pallidus* is a most variable plant in woods, often very attenuated and trailing, but always marked by its *elliptical* leaflets; the flowers frequently a bright mottled red, as are those of *hystrix*, and it appears to me that there is little difference between them, or rather a complete graduation from one to the other. Fruit seldom perfected.

*R. fuscus*, W. and N. Stem prostrate, succulent, hairy, with few setæ and weak prickles; leaves large, thick, and coriaceous, coarsely serrate, green and velvety beneath; panicle long, straggling, corymbose, often leafy to the summit, densely hairy and setose, with slender prickles interspersed; sepals hairy and setose, closely investing the

half-ripe fruit. In Cowleigh Park, and forming intricate thickets in Brockhill Wood, Colwall: green through the winter.

Very fine specimens have elongated, wide-spreading, nutant, and thyrsiform panicles, after the manner of *R. thyrsiflorus*, W. and N.: leaves larger and thicker than in any other British bramble.

*R. fusco-ater*, W. and N. Stem fringed with hairs, densely clothed with setæ and aciculi, graduating into unequal pale prickles; leaves pedate or quinate, the lowest pair on short stalks retrorse, the central one obovate or cordate-ovate, with unequal teeth, cuspidate, grey, with abundant hairs beneath; rachis clothed as the stem, grisly with hairs; panicle very hairy and setose, armed with long pale prickles; its branches short and leafy below, distant, but crowded at the summit; sepals silky, with long hairs extending beyond the setæ, reflex. In Cowleigh Park, and other thicketty spots.

A variable plant, much confounded in herbaria. I suspect the *R. Schleicheri* of W. and N. to be a state of it.

*R. Kœhleri*, W. and N. Stem densely armed with unequal straight prickles passing into aciculi; leaves quinate, with elliptical sharply serrate leaflets, closely hairy beneath; panicle long, narrow, very prickly, and setose. Not uncommon.

In its typical state easily distinguishable; but if *fusco-ater* be referred to it, as is done by Dr. Bell Salter, confusion at once ensues. I am inclined to refer the *echinatus* of Lindley here, as a form with a wider and more leafy panicle, and, if possible, more setose. This grows in Cowleigh Park.

*R. hirtus*, W. and N. Stem excessively hairy, the dense hairs extending beyond the setæ; prickles slender, deflexed; leaves on densely hairy and setose petioles, their leaflets sharply cut, and grey with appressed hairs beneath; rachis densely hairy, setose, and prickly; panicle with distant acutely-ascending leafy branches below, upper ones crowded; peduncles and calyces shaggy, with long hairs concealing setæ. In thick woods.

*B. candicans*. The petioles, under side of the leaves, rachis, and panicle canescent, with such thick-set hairs that the setæ are completely buried in them. In the Priory Grove, Little Malvern. This remarkable form Mr. Babington has referred to *R. fusco-ater*, but I think it belongs to *hirtus*.

*R. scaber*, W. and N. Stem angular, not hairy, but horrent with falcate or strongly declining prickles, intermixed with innumerable short setæ and aciculi, all having red verrucose bases dispersed on all

sides ; leaves ternate or pedate, smooth beneath, leaflets obovate, crisped and wavy at the margin, deeply cut, their midribs fringed with small prickles ; panicle long, spreading, subracemose ; lower branches distant, leafy, upper ones closer ; peduncles hairy, densely prickly, and closely setose ; sepals woolly and thorny ; loosely reflex in flower and fruit. Rare. Woods on the Old Storage. An excessively prickly form.

*R. rudis*, W. and N. Stem dark and sulcate, hispid with short setæ, the prickles extending beyond them ; leaves quinate, their lateral leaflets elliptical ; central one obovate, lanceolate, sharply incised, grey with pubescence beneath ; panicle long, hairy, leafy, very setose and prickly, with short branches crowded at the summits. Common in woods and thickets.

*R. Radula*, W. and N. Stem hispid, with numerous nearly equal setæ and few aciculi, above which the prickles stand very distinct and unconnected ; leaves quinate, their leaflets ovato-elliptical, central one ovate, greyish beneath, and doubly dentate ; panicle long, hairy, and setose, armed with long descending prickles ; lower branches distant and leafy, upper ones closer ; sepals very hairy and setose, elongated and reflex. Woods and thickets.

A fine straggling thicket bramble, and variable in aspect according to exposure ; but differing from the general mass of glandulose Rubi by the fringe of setæ and aciculi on its barren stem not graduating into prickles, and the latter not ranging very close together.

iii. RUBI VILLOSI. Stem angular, arching, more or less hairy, with occasional setæ ; rachis very hairy.

*R. villicaulis*, W. and N. Stem covered with dense white hairs ; leaves quinate, densely ciliated with stiff hairs beneath ; rachis closely covered with spreading and decumbent hairs ; panicle long, with alternate ascending short cymose branches, the greater number naked, and few flowered towards the summit. Not common. Rough Hill Dingle, and woods at Alfrick.

Very characteristic from the white silkiness of the long, mostly narrow panicle, and downy floral leaves. One of the most elegant of British brambles, if contemplated just before the expansion of the flowers.

*R. vestitus*, W. and N. (*R. leucostachys*, Sm.) Stem covered with fascicled unequal hairs (often in maturity denuded) ; prickles pungent, hairy ; leaves quinate, coriaceous, on hairy and prickly petioles, and white with dense pubescence beneath, the central leaflet roundish-cordate, cuspidate ; panicle long, very hairy, closely armed in the central

part, but less so above and below; calyx covered with long hairs, concealing glands; petals downy. Rough Hill Wood, &c. Rather common.

A well-marked form in its typical state, but very puzzling varieties with denuded stems often occur.

*R. incurvatus*, Bab. Stem angular, sulcate, slightly clothed with scattered hairs, and armed with distant declining prickles; leaves pedate or quinate, central and intermediate leaflets ovate, undulating, crisped, and serrate-dentate at the edges, gradually acuminate, and ending in a curved point, the lower pair of leaflets seated on the intermediate, and somewhat overlapped by them; rachis downy; panicle long, flexuous, with distant racemous branches, the greater portion leafy, upper ones short and densely clustered; peduncles downy and densely hairy, armed with long pale prickles; calyx closely downy; the sepals incurved about the flowers and immature fruit. Rare. Thickets between Cowleigh and Worcester.

This has a peculiar aspect, with a long narrow panicle, far more crowded and hairy than that of *corylifolius*, to which Dr. Bell Salter has referred it.

*R. pampinosus*. Stem angular, polished, with only short inconspicuous hairs, armed with many very small declining prickles at the base, longer higher up the stem; leaves large, thin, and flexible, with scattered ciliated hairs on the veins beneath, lower leaflets seated on the intermediate, central one ovate or cordate-ovate, with coarse serratures; rachis with a dense fringe of spreading hairs; panicle very long, with paniculate lower branches, shortening but spreading out wider as they ascend in a thyriform manner, and with ternate axillary leaves nearly to the summit; sepals densely hairy, with scattered prickles, loosely reflex in flower and fruit. In dense thickets, Cowleigh Park.

A very remarkable bramble, with leaves so large and numerous as almost to conceal the stem. It is related to my friend Bloxam's *R. calvatus*, but without the savage aspect of that rough bramble; its leaves are almost naked, green on both sides, and its enormously lengthened, wide-spreading panicle, whose upper branches are nutant in fruit, give it claims to correct discrimination. The stem often becomes quite denuded, when it might be confounded with *R. cordifolius*.

iv. RUBI PILOSI. Stem arching, angular, with equal prickles, sparingly clothed with spreading hairs.

*R. carpinifolius*, W. and N. Stem clothed with scattered hairs, and



armed with yellowish deflexed prickles; leaves quinate, hairy above, glaucous-green, and pubescent beneath, central leaflet obtusely wedge-shaped, with a long cusp; panicle long, often narrow, white with hairs, concealing glands, close at the summit. Colwall Woods.

*R. amplificatus*, Lees. Stem decumbent, very long, with scattered hairs, and deflexed prickles; leaves quinate, the leaflets elliptical, central one with a long cusp; panicle long, narrow, hairy, leafy below, the branches short and few-flowered above. In most of the woods about Malvern and Worcester.

*β. Schlechtendalii*, W. and N. Stronger and larger, with a wider developed panicle, and monstrous foliage. A singular bush of this form grows in Cowleigh Park, where it has existed many years, in the ravine by a little bridge; it has enormously developed panicles, with long paniculate branches. The shrub extends itself proliferously by annual shoots (not rooting) proceeding from the axils of the leaves.

*R. macrophyllus*, W. and N. Stem clothed with hairs, prickles numerous but small; leaves ternate and quinate, smooth above, the ribs and veins covered with long hairs beneath; rachis densely clothed with hairs; panicle long, with numerous spreading branches, leafy nearly to the summit; peduncles hairy, often concealing glands; fruit small. Upper part of Cowleigh Park.

*v. RUBI CANDICANTES.* Stem sulcate, angular, glaucous, hoary, with equal prickles.

*R. discolor*, W. and N. Stem glaucous, with minute pubescence; prickles falcate, strong, and numerous; leaves quinate, smooth above, hoary-white beneath, coriaceous; leaflets elliptical or ovate-oblong, acute, and deeply serrate; panicle long, narrow, compound, hoary, with patent almost leafless branches. Woods and thickets. Common.

This is the old "*fruticosus*" of English authors, and although not so variable as many other brambles, yet in the variety *macroacanthus* the stem becomes so silky, and the panicle loosely tomentose, as to put on a very different aspect to the type. Perhaps the following should only be considered a variety, but its aspect is very elegant.

*R. argenteus*, W. and N. Stem downy, or closely tomentose; leaves quinate, their leaflets sharply dentate, with long cusps, smooth and shining above, silvery, with dense tomentum beneath; rachis tomentose; panicle hairy and prickly, the upper branches densely crowded; peduncles shaggy, closely armed with slender prickles; sepals densely tomentose, closely reflex in fruit. Not common. Hedges near Cotheridge.



vi. RUBI NITIDI. Stem arched, angular, sulcate, smooth; prickles nearly equal; sepals reflex in fruit.

*R. Lindleianus*. Stem hairy at the base, but with only scattered hairs and polished above; prickles numerous, sharp, declining; leaves quinate, their leaflets elliptical, jaggedly serrate, and plicate at the edges; panicle long, with numerous branches, generally spreading at right angles to the stem, densely crowded, compound and thorny, clothed with unequal hairs; floral leaves incised, narrowing upwards to the entangled summit. Hedges and thickets. Not uncommon.

This bramble I originally received from Mr. Leighton, the author of the "Shropshire Flora," as *R. leucostachys* of Dr. Lindley; but it is not the plant of Smith. Mr. Babington continues the name of *nitidus* for it, as given by Dr. Bell Salter; but not being the plant of *Rubi Germanici*, it can have no claim to an appellation given in error. See *Phytologist* for a full account of this plant.

*R. cordifolius*, W. and N. Stem quite smooth, with distant prickles; leaves quinate, coriaceous, greyish-green beneath; central leaflet cordate; panicle downy, lower branches spreading, leafy, upper ones cymose, crowded. Common in woods.

*R. affinis*, W. and N. Stem sub-erect, finally arching, smooth and polished, with declining yellow-pointed prickles; leaves quinate, all the leaflets stalked and plicate, shining above, pale green with soft pubescence beneath, irregularly dentate, central one cordate-ovate, acuminate; panicle short and broad at the summit, with two or three distant axillary branches below; peduncles hairy, densely prickly; sepals hairy, elongated, reflex after flowering, but again rising to half invest the deep black cylindrical fruit. Forming thickets among waste pastures below Malvern Wells, but rare.

This bramble seldom throws out rooting shoots, and never, as far as I have seen, occurs in hedges. Distinguishable at first sight from the two preceding, and closely approaching the sub-erect brambles.

B. *Fruticose brambles, erect or sub-erect, not rooting. Biennial.*

vii. RUBI SUBERECTI. Sub-erect, with quinate or septenate leaves.

*R. plicatus*, W. and N. Stem sub-erect, angular, smooth, and polished; prickles strong and sharp; leaves quinate, the leaflets all stalked, central one cordate-ovate, dentate apiculate, with wide serratures, cuspidate, dark green above, pale green and pilose beneath; rachis downy; panicle simple, or long with many axillary branches, and large floral leaves; sepals pilose, patent, or very loosely reflex in fruit.

Rare. In moist thickets below Moorall's Well, Colwall. Birchen Grove, Worcester.

A fine tall shrub, its stem rising high in thick woods in a sub-erect manner, and often remains without any support the second year, in this case throwing out short bunches of flowering shoots from the summit, after the manner of the raspberry; but when the stem declines to the ground the panicle becomes longer, and the lower branches distant; the floral leaves are very large, ternate below, cordate above, and often rising above the panicle; fruit large, irregular, consisting of many drupeolæ, red for a time, finally deep black; the calyx is but loosely reflex, and its pilose sepals often even invest the ripe fruit.

viii. RUBI IDÆI. Erect, generally with pinnate leaves.

*R. Idæus*, Linn. Raspberry. Stem round, pruinose, covered with minute prickles; leaves pinnate, white and plaited beneath; flowers in axillary corymbs, drooping. Woods of Colwall, Mathon, &c.; base of the North Hill, below the Ivyscar Rock.

FRAGARIA. *F. vesca*. Wood strawberry. Very plentiful, especially on one of the buttresses of the Herefordshire Beacon, called "Strawberry Hill." Though very minute, the fruit is as delicious in flavour as any of the cultivated varieties. "Probatum est."

POTENTILLA. Cinquefoil. *P. anserina*. Silver-weed. Road-sides.

*P. argentea*. Hoary cinquefoil. On the rocks of the Worcester-shire Beacon, and the North and Raggedstone Hills.

*P. verna*. Spring cinquefoil. On the rock above Clatter's Cave on the south-west side of the Herefordshire Beacon, and in a rocky hollow above the road from Little Malvern to Winds' Point. Also on the rocky side of Purlieu Lane, Mathon.

*P. reptans*. Creeping cinquefoil. *P. Fragariastrum*. Barren strawberry.

TORMENTILLA. *T. officinalis*. Common tormentil.

*T. reptans*. Trailing tormentil. Welland Common. This is small, as are most of the Malvern plants, and the trailing stem does not take root at the joints as in *Pot. reptans*. Leaflets mostly ternate, hairy on the ribs beneath. Almost intermediate between the preceding and *Potent. reptans*.

GEUM. *G. urbanum*. Common Avens. Everywhere.

*G. rivale*. Water Avens. Rare. Banks of Sapey Brook.

*G. intermedium*. Intermediate Avens. The larger flowers, patent calyx, and hairy upper joint of the awn, distinguish this plant from *G. urbanum*; but the foliage is exactly intermediate between the latter

and *G. rivale* : petals brilliant yellow ; flowers slightly nodding. Upper Sapey, near the bridge over the brook.\*

## POLYANDRIA.

PAPAVER. Poppy. *Argemone, dubium, Rhæas*. E. and W.

CHELIDONIUM. *C. majus*. Common celandine. Lanes.

HELIANTHEMUM. Rock-rose. *H. vulgare*. Heref. Beacon, &c.

TILIA. Lime-tree. *T. parvifolia*. Young shoots polished, glabrous ; leaves cordate, smooth, glaucous beneath, with smooth veins, and a tuft of brown wool at their common origin, and axils ; fruit small, globose, downy, scarcely ribbed, and thin and brittle. Plentiful in woods in the parish of Berrow, &c.

*T. Europæa*. Young branches glabrous ; leaves on long petioles, smooth, except a hairy tuft at the origin of each vein beneath ; cymes many-flowered, the bractæas extending to the coriaceous downy fruit. Scattered in woods.

*T. grandifolia*. Young branches hairy ; leaves cordate-acuminate, on hairy petioles, hairy beneath, with small tufts at the origin of the veins ; fruit densely woolly, coriaceous, on long pedicels extending beyond the bractæas. Rare, solitary trees only occurring, as at Folly Copse, Alfrick, and on the hill above Cowleigh Park.

N.B. Some large trees of *T. grandifolia* occur in a field near the Priory Farm, Little Malvern ; perhaps originally planted by the monks. In a natural wood at the N.E. base of the Warren Hill, *T. Europæa* occurs in clumps, cut down as coppice-wood. At the Brown's-end, Bromsberrow, is a tall noble tree of *T. parvifolia*, in an angle of the road. *T. parvifolia* also occurs undoubtedly wild in woods on the Old Storage, on the banks of the brook above Bridges Stone Mill, on Rosebury Rock, Knightwick ; in Stockton's Copse, Mathon, &c.

NUPHAR. *N. lutea*. Yellow water-lily. In the Ledden at Ledbury, but not in the streams near the hills.†

DELPHINIUM. *D. Consolida*. Field larkspur. Rare. E.

AQUILEGIA. *A. vulgaris*. Common columbine. Borders of woods westwards, both with purple and white flowers. Coppices near Brand Lodge, Cowleigh Park, &c. Truly wild in this district.

\* For a notice of many plants gathered in this interesting spot, see the *Botanical Looker-Out*, p. 182.

† *Nymphæa alba* has been introduced into the pool in Mr. Berrington's grounds at Little Malvern ; but it nowhere occurs wild in this district.

THALICTRUM. *T. flavum*. Meadow rue. Longdon Marsh. By the Teme side, near Leigh Church.

CLEMATIS. *C. Vitalba*. Traveller's joy. Very common. E. and W. Most luxuriant on the calcareous strata.

ANEMONE. *A. nemorosa*. Wood Anemone. General.

RANUNCULUS. Crowfoot.

FLOWERS WHITE. *R. aquatilis*, *R. aq. β. pantothrix* (in little pools on Welland Common), *R. hederaceus*. *R. fluitans*, with stems many feet in length, occurs in the Teme at Powick.

FLOWERS YELLOW. *R. Flammula*, *Ficaria*, *auricomus*, *sceleratus*, *acris*, *repens*, *bulbosus*, *hirsutus*, *arvensis*, *parviflorus*. The latter not very uncommon on dry banks, as about Barnard's Green and Powick. I have only gathered *R. hirsutus* in a barren pasture bordering on Longdon Marsh.

N.B. Mr. Ballard, surgeon, of Hanley Castle, mentions *R. Lingua* as occurring in "bogs on Malvern Chace" about fifty years ago; but drainage having removed the bogs, this plant has now disappeared.

HELLEBORUS. *H. viridis*. Green hellebore. Near Hanley Castle; according to Mr. Ballard, in Withering. Tedstone, near Knightsford Bridge (Hon. Mrs. Cradock).

*H. fœtidus*. Fœtid hellebore. A large bushy inelegant plant, with remarkably digitated leaves, very sharply serrated. The drooping lurid flowers appearing in March, however, attract notice at that early period. By the side of the lane leading from the Leigh Road to Bransford Chapel. In a deep lane near Lulsley Church.

CALTHA. *C. palustris*. Marsh marigold. Specious in spring, when its large flowers flash golden radiance on the brook-sides.

### DIDYNAMIA.

MENTHA. Mint. *M. rotundifolia*. Round-leaved mint. In a ditch by the roadside from Alfrick to Lulsley (Miss Moseley). Banks of Sapey Brook, Knightwick. A very shaggy plant, with a strong scent.

*M. viridis*. Spear-mint. Formerly on the side of a deep ditch below the Link; by a rill falling into Sapey Brook, near Tedstone.

*M. piperita*. Pepper-mint. Plentiful on Welland Common.

*M. aquatica*. Hairy mint. Common in watery places.

*M. sativa*. Marsh whorled mint (*acutifolia*, Smith). "Near Worcester" (Herb. Nat. Hist. Soc.).

*M. gentilis*. Bushy red mint. Rare. Teme side, Powick Weir, and near Broadwas.

*M. arvensis*. Field mint. Edges of fields and ditches.

*M. Pulegium*. Penny-royal. Covering the edge of a pool called "The Flodder," just below the great elm, Barnard's Green. Also on Newland's Green, and at Hanley.

THYMUS. *T. Serpyllum*. Wild thyme. H. Abundant. A very glandulose variety of this is considered distinct by several botanists.

ORIGANUM. Organy. *O. vulgare*. In woods at the western base of Keysend Hill ; also at Cruce Hill, Alfrick.

TEUCRIUM. *T. Scorodonia*. Wood sage. Common.

AJUGA. *A. reptans*. Creeping bugle. Moist pastures, plentiful. Near the Chalybeate, with white flowers.

BALLOTA. *B. nigra*. Foetid black horehound. This occurs with white flowers in several spots.

GALEOBDOLON. *G. luteum*. Yellow weasel-snout. Woods. Plentiful.

GALEOPSIS. Hemp nettle. *G. Ladanum*, *G. Tetrahit*.

LAMIUM. Dead nettle. *L. album*, *purpureum*, *incisum*, *amplexicaule*. The two last not common. About Redmarley, Powick, &c.

BETONICA. *B. officinalis*. Wood betony. Occurs with white flowers.

STACHYS. Woundwort. *S. sylvatica*, *palustris*, *arvensis*.

NEPETA. *N. Cataria*. Catmint. On the roadside, near the Winds' Point, Herefordshire Beacon, and at Chance's Pitch ; also at Powick.

GLECHOMA. *G. hederacea*. Ground ivy. Under hedges, common.

MARRUBIUM. *M. vulgare*. White horehound. About Welland and Castle Morton Commons.

CALAMINTHA. *C. officinalis*. Calamint. About the eastern bases of the hills ; not uncommon. Very fine at the Holly-bush Hill.

CLINOPODIUM. *C. vulgare*. Wild basil. Of general occurrence.

MELISSA. *M. officinalis*. Officinal balm. Hanley, near farm-houses, naturalised. At Alfrick, and in the lane between Powick and Bransford.

PRUNELLA. *P. vulgaris*. Self-heal. Moist spots.

SCUTELLARIA. *S. galericulata*. Large skull-cap. Flowers in pairs, blue, downy ; an elegant plant in watery places. By the side of Dane-moor Pool, Welland Common ; and by ponds on Barnard's Green.

BARTSIA. *B. Odoniites*. Red Bartsia. Calc. strata. E. and W.

EUPHRASIA. *E. officinalis*. Common eye-bright. E.

RHINANTHUS. *R. Crista-Galli*. Yellow rattle. Fields.

MELAMPYRUM. *M. pratense*. Yellow cow-wheat. Woods.

Also *β. montanum*, with entire bracteas, in the hilly woods.

LATHRÆA. *L. squamaria*. Toothwort. A singular parasitical plant, growing on the roots of various trees, and only noticeable in April and



May by its sickly hue and very pale purple raceme of flowers. The common name applies better to the *unripe capsules*, which are much like human teeth, rather than to the *fleshy scales* on the stem. This plant varies much in height, according to exposure. I gathered a specimen under a white poplar, near Bridges Stone Mill, nearly eighteen inches high, while one under a maple in Purlieu Lane was scarcely three inches. The old locality in Holly-Lodge grounds is destroyed; but the Rev. H. Stretch gathered it (1852) in a wood north of Purlieu Lane; and Mr. Cheshire under a hazel by the roadside at the top of Chance's Pitch, near the lodge at the entrance to Eastnor Park. Very abundantly also in a deep ravine under yew-trees, near White House, Berrow.

**PEDICULARIS.** *P. sylvatica*. Dwarf red rattle. Common in wet spots all over the hills. With white flowers on a part of Holly-bush Hill, near "The Gullet."

**ANTIRRHINUM.** *A. majus*. Great snapdragon. On old walls.

*A. Orontium*. Lesser snapdragon. Not very common. E.

**LINARIA.** *L. Cymbalaria*. Ivy-leaved toad-flax. Walls. Straggling doubtless from gardens.

*L. spuria*. Ovate-leaved Fluellen. In a young state this is often hardly distinguishable from the next, but its leaves never become hastate. Calyx large, hairy, segments lanceolate; flowers yellow, upper lip of the deep purple of *Geranium phæum*. In corn and fallow fields.

*L. Elatine*. Sharp-pointed-leaved Fluellen. In corn-fields at the Croft Farm, Mathon, near the lime-quarries there, with the above; also in fallow fields at Powick and Bushley. E. and W.

*L. vulgaris*. Butter and eggs toad-flax. Common.

*L. minor*. Least toad-flax. With numerous small axillary purplish-yellow flowers. On the borders of fields about the Croft Lime Works, Mathon; and on the calcareous soil near Cowleigh Farm.

**SCROPHULARIA.** *S. nodosa*. Knotted figwort. *S. aquatica*. Water figwort. Welland Common.

*S. Ehrharti*. (?) There is a *Scrophularia* in the Herb. Nat. Hist. Soc. at Worcester, with cream-coloured flowers, that appears to be this species. It was gathered near Alfrick Chapel, by Mr. G. Reece, in 1845.

**DIGITALIS.** *D. purpurea*. Purple foxglove. A very characteristic and beautiful Malvern plant, spreading over the hills in magnificent attire and endless profusion. A few *white-flowered* specimens are occasionally found. The foxglove produces abundance of seed, yet wanders but little from the ground it has held for centuries. The name



was originally *Folks-glove*, its flowers being supposed to be a favourite resort of the fairies, or "good folk," as once commonly called.

**VERBENA.** *V. officinalis*. Common Vervain. About Hanley, &c.; generally close to farm-houses, as at Garford Court, Barnard's Green, though little cultivated in the present day. Perhaps it may have been more used formerly, as I have heard of its being highly valued by the worn-out race of village doctresses. At Dog Hill, Ledbury, and on the south side of Newland Chapel.

**OROBANCHE.** *O. major*. Greater broom-rape. Parasitical on the roots of broom, about the hills, but not in any great plenty. Even in perfection standing up brown and rigid like a dead plant. Spike of flowers very long; I counted seventy blossoms in one spike. Eastern base of Herefordshire Beacon, Holly-bush Hill, and near the Wells; also on Rosebury Rock. E. and W. Always growing among broom.

*O. elatior*. Tall broom-rape. Stem simple; corolla funnel-shaped; lower lip three-lobed, with acute, nearly equal segments; stamens downy, style smoth. Exceedingly rare. The present plant is of a light primrose colour, which it retains in a dried state; the flowers of the spike are not so crowded or numerous as in *O. major*, and they become gradually more distant from each other lower down, till at the base of the stem they are widely separated. Gathered by Miss Moseley in a clover-field below the Abbey, Great Malvern.

*O. minor*. Lesser broom-rape. Rare, and of uncertain occurrence. In a field at Lower Wick, 1847.

**LIMOSELLA.** Mudwort. *L. aquatica*. On the margin of New Pool, near the Firs Common; and by a pool on Newland Common. This is a curious little plant, throwing out runners which take root, and speedily producing fresh leaves and flowers, so that it is plentiful in the seasons when it appears at all. Also on Welland Common.

## TETRADYNAMIA.

**SENEBIERA.** *S. Coronopus*. Common wart-cress. In dry spots.

**ISATIS.** *I. tinctoria*. Dyer's or ancient British woad. This splendid plant occurs at the extreme south-east boundary of this district, where it profusely adorns the red marl cliff at the Mythe Tout by the Severn, one mile from Tewkesbury, and opposite Sarn Hill, Bushley.

**THLASPI.** *T. arvense*. Penny-cress. In cultivated fields.

**TEESDALIA.** *T. nudicaulis*. Naked-stalked Teesdalia. Not frequent. By the side of the new road to the Wyche, among stones.

**CAPELLA.** *C. Bursa-Pastoris*. Common shepherd's-purse.

LEPIDIUM. *L. campestre*. Common Mithridate pepperwort.

*L. Smithii*. Smith's pepperwort. Distinguished by its exserted style, glaucous foliage, and smaller size. On rocks in Cowleigh Park, and by the roadside leading from Welland Common to Hanley Swan.

*L. Draba*. Whitlow pepperwort. Radical leaves oblong, entire or toothed, those of the stem sagittate clasping; pouch cordate; style as long as the dissepiment. A tall plant, producing a corymb of very numerous small white flowers on long pedicels. At Powick, on the embankment of the new road, west of the iron bridge, where it has flourished for nine years (1852).

*L. sativum*. Garden cress. Naturalised in many spots.

DRABA. *D. verna*. Common awlwort. Abundant.

KONIGA. *K. maritima*. Maritime Koniga. In the lane near the Chalybeate Spa, in 1841. Flowers small, white, and fragrant.

CARDAMINE. *C. amara*. Bitter cuckoo-flower. Rare. Near Red Marley, and on the banks of the Severn. At Rushwick, and on the side of Laughern Brook. Anthers purple, while in the following they are yellow. The taste of the foliage is insufferably nauseous.

*C. pratensis*. Common cuckoo-flower. When the associated flowers of this plant cover the damp meadows with spreads of silver, the advance of spring is confirmed, and sounds of delight are heard on all sides from the joyous birds.

*C. impatiens*. Impatient cuckoo-flower. Leaves pinnate, leaflets lanceolate, cut or entire; flowers minute and inconspicuous. When ripe, the valves of the pod burst open with much force. *This is quite a common plant all about the eastern bases of the hills.*

*C. hirsuta*. Hairy cuckoo-flower. Common in moist stony spots.

*C. sylvatica*. Flexuous wood cuckoo-flower. This is a taller plant than the preceding, and always growing in wet shady places, whence perhaps its differences may arise. In the wet coppices below the "Admiral Benbow," and other springy woods. E.

BARBAREA. *B. vulgaris*. Winter-cress or yellow rocket.

*B. præcox*. Early winter-cress. By the roadside near New Pool. Gathered by Mr. T. Westcombe, 1846.

NASTURTIUM. *N. officinale*. Water-cress. Eastern commons.

"The aged matron, forced in age for bread  
To strip the brook with mantling cresses spread,"

may yet be met with at Malvern, to offer her salutary greens to visitors, and to pledge her veracity to their health-exciting powers.

*N. sylvestre*. Creeping river-cress. Severn side, and by the Teme at Powick.

*N. terrestre*. Creeping land-cress. On Welland Common, and on the margin of New Pool, and others about the Chace. Leaves pinnatifid, the petals not exceeding the calyx; pods oblong, turgid, as long as their pedicels.

ARMORACIA. *A. amphibia*. Amphibious cress. In ditches, but not very common. E. Pools near the Severn.

SISYMBRIUM. *S. officinale*. Hedge mustard. Most abundant.

*S. Thalianum*. Common Thale cress. H. Widely spread.

ALLIARIA. *A. officinalis*. Sauce-alone. Common.

CHEIRANTHUS. *C. Cheiri*. Wall-flower. On Little Malvern Priory, but naturalised.

BRASSICA. Cabbage and turnip. *B. Napus*, *Rapa*, *campestris*.

SINAPIS. Mustard. *S. arvensis*, *nigra*. Both abundant.

## MONADELPHIA.

ERODIUM. *E. cicutarium*. Hemlock stork's-bill. Growing on the ground in a circular manner; foliage often red, leaves pinnate, with cut sessile leaflets. Chance's Pitch, &c.

*E. moschatum*. Musky stork's-bill. Leaves much larger than the last, with a powerful musky scent. On Lumbertree Bank, Welland Common.

*E. maritimum*. Sea stork's-bill. Leaves stalked, ovato-cordate, lobed and cut; flowers almost apetalous. At the eastern base of the North Hill, before the path turns to the Ivyscar Rock. Plentiful there in 1841, but since obliterated by the formation of a donkey-stand at the spot. On the northern bank of the common at Barnard's Green, under the hedge.

GERANIUM. Crane's-bill. *G. phæum*. The purplish-black flowers of this species at once distinguish it. Very rare. By the side of a watery lane beyond Hale's End, Cradley (Dr. Addison).

*G. striatum*. Among a number of wild plants that have sprung up on the stone bank of the esplanade at Worcester, this appeared in 1852.

*G. pratense*. In moist meadows not uncommon.

*G. pyrenaicum*. Rare. In some plenty under the hedge of a meadow by a footpath between the Cotheridge and Bransford roads, St. John's, near Worcester.

*G. pusillum*. By roadsides in many places.

*G. dissectum*. Of general occurrence.

*G. columbinum*. In gravelly places. A very pretty species, with the flowers on long pedicels.

*G. rotundifolium*. (?) Uncommon, and I feel somewhat uncertain of its locality.

*G. molle*. Almost everywhere.

*G. lucidum*. Stalks red as sealing-wax, lucid and polished; flowers rose-pink. An elegant species. Not uncommon on the rocks at the base of the hills. Plentiful by the roadside near Little Malvern Church.

*G. Robertianum*. Plentifully dispersed.

MALVA. Mallow. *M. sylvestris*, *rotundifolia*, *moschata*. The latter grows on some of the North Hill rocks very beautifully.

### DIADELPHIA.

CORYDALIS. *C. claviculata*. White climbing Corydalis. Stem much branched, clinging with its delicate tendrils to the loose stones among which it grows. On the declivities of the North Hill, rather luxuriant. In flower all the summer and autumn.

FUMARIA. *F. capreolata*. Ramping fumitory. *F. officinalis*. Common fumitory.

POLYGALA. *P. vulgaris*. Milkwort. Frequent on the western side of the range with pink flowers, rarely white or blue.

ULEX. *U. Europæus*. Common furze, or "fuzzen." Primary spines leafy to the middle, hairy; primary leaves decurved, shaggy beneath; calyx shaggy, with converging and cohering teeth; bracteas ovate, lax. Plentiful on the commons at the eastern base of the hills, and in the lanes opening upon them. Flowering from January to May.

*U. nanus*. Lesser decumbent furze. Lower leaves small, ovate, ascending, very hairy beneath, gradually becoming horizontal and decurved; spines glabrous, horizontal, scarcely longer than the leaves; bracts minute, appressed; calyx finely downy. On the hills.

*U. Gallii*. Great autumnal furze. Primary spines strong, leafy at the base only, smooth, decurved; primary leaves spreading horizontally or curved, fringed with long marginal hairs; calyx finely pubescent, with divergent teeth; bracteas minute, appressed. Growing in round tufts on the hills, and flowering from July to October, the legumes remaining till the following year before ripening. In the first edition I referred this to *U. nanus*, but my "minor" was really the typical *small* autumnal gorse.

SAROTHAMNUS. *S. scoparius*. Common broom. On the hills.

GENISTA. *G. tinctoria*. Dyer's greenweed. Erect, unarmed, with flowers in long spikes. Plentiful.

*G. anglica*. Needle greenweed. Stems declined, armed with many curved spines; flowers in axillary clusters. Rare. On Welland Common, and in pastures at Colwall.

*G. pilosa*. Hairy greenweed. Mr. Borrer, so well known as an eminent British botanist, has recorded gathering this rare plant by the roadside between Malvern Wells and Little Malvern; but it is not now to be found there.

ONONIS. *O. arvensis*. Common rest-harrow. *O. spinosa*. Spinous rest-harrow. Longdon. E.

ANTHYLLIS. *A. Vulneraria*. Kidney-vetch, or lady's-finger. Flowers in crowded heads, yellow. Mostly confined to the calcareous strata, where, as at the Croft Limeworks, it is abundant. But it also grows at Castle Morton on red marl. Side of the road just beyond the Lodge at the entrance to Eastnor Park.

OROBUS. *O. tuberosus*. Bitter heath vetch. Woods.

*O. tenuifolius*. With linear leaflets; a very elegant plant. Rare. Among furze on the Seats Common, Malvern. Gathered there in 1852, with my esteemed friend the Rev. J. H. Thompson.

LATHYRUS. *L. Nissolia*. Crimson grass vetch. Leaves simple, linear-lanceolate, without tendrils, so much like grass as to be scarcely distinguishable, except when the plant is in flower. Rare. On the edge of the wood near the Croft Limeworks, Mathon; also about Maddresfield. Flowers crimson, single or in pairs. An elegant plant.

*L. Aphaca*. Yellow vetchling. Very rare. In an arable field by the side of Cabbage Lane, Powick. Noticed there for several successive years by an acutely observant botanist, Mr. T. Baxter, of the College School, Worcester.

*L. pratensis*. Meadow vetchling. Flowers yellow.

*L. sylvestris*. Narrow-leaved everlasting pea. Not common. Near Pendock Portway.

*L. latifolius*. Broad-leaved everlasting pea. "Severn Stoke Copse." Dr. Stokes, in Withering.

*L. palustris*. Blue marsh vetchling. Stem prostrate if not supported, peduncles 3-6-flowered. Very rare. Only in a marshy meadow on the western side of Longdon Marsh, by the side of the lane leading from Castle Morton to the marsh.

VICIA. *V. sylvatica*. Wood vetch. Leaflets in many pairs, peduncles many-flowered. The stems, by means of their tendrils, twine to a



considerable height among the trees where the plant abounds. This elegant vetch, whose clusters of blue-veined flowers have so beautiful an effect in the woods in July, flourishes in the coppices of most of the calcareous heights that rise like watch-towers or tumuli on the western side of the Malvern chain. Rowbury Hill, Frith Wood, &c.

*V. Cracca*. Tufted vetch. Flowers in drooping clusters, violet.

*V. sativa*. Common vetch. Sides of fields.

*V. angustifolia*. Narrow-leaved vetch. Stony places on the hills.

*V. lathyroides*. (?) Spring vetch. On the hills, small.

*V. sepium*. Bush vetch. Very common.

*V. Bithynica*. Rough-podded purple vetch. Flowers stalked, solitary; legumes upright, hairy. Rare. On the borders of a large field below the "Admiral Benbow," Malvern Wells. Cherkenhill, Leigh, according to Dr. Abbot, in "English Botany." Sandlin, near Alfrick, by the roadside; and in a field between Alfrick and Hopton Court. Plentiful about Broadwas.

ERVUM. Tare. *E. hirsutum* and *E. tetraspermum*.

ASTRAGALUS. *A. glycyphyllus*. Sweet-milk vetch. Woody hills. W.

ORNITHOPUS. *O. perpusillus*. Little bird's-foot. Hills, plentiful.

ONOBRYCHIS. *O. sativa*. Saintfoin. Western side of Brockhill. W.

MELILOTUS. *M. officinalis*. Common yellow Melilot. W. and E.

TRIFOLIUM. Trefoil. *T. repens*, *pratense*, *medium*, *arvense*, *striatum*, *fragiferum*, *procumbens*, *filiforme*, *minus*. A proliferous variety of *repens* occurs near the Wells. The little silky-leaved *T. striatum* has a very characteristic appearance on some of the rocks, with its pale rose-coloured flowers, and is plentiful at the base of the Holly Bush.

LOTUS. Bird's-foot trefoil. *L. major*, *corniculatus*.

MEDICAGO. *M. sativa*. Lucerne. A hedge straggler. Powick.

*M. lupulina*. Black medick. On waste ground, walls, &c.

*M. maculata*. Spotted medick. Not common. Abundant in a grassy path in Mr. Smith's large Hopyard at Wick, not far from the Severn, where my friend, Mr. Thomas Baxter, of the College School, Worcester, pointed it out to my notice.

## POLYADELPHIA.

HYPERICUM. *H. calycinum*. Large-flowered St. John's wort. In a plantation by the roadside at Little Malvern, but probably introduced.

*H. Androsæmum*. Tutsan. Shrubby, with large leaves in opposite pairs, flowers in short terminating panicles. Not uncommon in deep

shady lanes about the Wells and Little Malvern, Purlieu Lane, Leigh Sinton, &c. On Crumpend Hill, Cradley.

*H. quadrangulum*. Four-winged St. John's wort. About streams on the eastern side of the hills, Welland Common, &c.

*H. dubium*. Imperforate St. John's wort. Leaves elliptic-ovate, destitute of pellucid spots. Local, but not very uncommon on the sides of ditches on both sides the hills. Flowers showy, crowded, strongly marked with black streaks and dots.

*H. perforatum*. Common St. John's wort. Plentiful.

*H. humifusum*. Trailing St. John's wort. H. Often very small.

*H. montanum*. Dr. Addison records this in a list of plants given in the *Provincial Medical Transactions*, but I have not met with it myself. "Southern part of the range" (T. Westcombe).

*H. hirsutum*. Hairy St. John's Wort. Common.

*H. pulchrum*. Pretty upright St. John's wort. Waste woody spots. I have gathered a dwarf variety of this species, with a wide membranous border to the leaves, which have pellucid spots only at their extremities. The stem and young leaves very red. On the Warren Hill.

## SYNGENESIA.

TRAGOPOGON. *T. minor*. Common. Meadow goat's-beard. "Involucre about twice as long as the florets." Common in pastures on both sides of the hills. Also var. *β. major*. Under hedges this grows very tall, with scymetar-shaped leaves, suddenly broad at the base; peduncles thickened upwards; involucre about half as long again as the closed corolla.

N.B. There appears really to be but one species of British *Tragopogon*, and, as far as I have seen, all the plants have their involucre much longer than the florets at *their first opening*; but as the achenes grow and rise upwards, the florets are elevated till they become *level with the involucre*. The plant has then the character of *T. pratensis*, but instances of equal and unequal florets and involucre may be seen on the same specimen.

HELMINTHIA. *H. echinoides*. Bristly ox-tongue. W. and E.

PICRIS. *P. hieracioides*. Hawkweed Picris. Calcareous soil.

SONCHUS. Sow-thistle. *S. arvensis* and *β. asper*; *S. oleraceus*.

LACTUCA. Lettuce. *L. Scariola*. Prickly lettuce. Rare. At Longdon Hill End, on the side of the path from Welland.

PRENANTHES. *P. muralis*. Wall lettuce. On rocks westward, as well as at Little Malvern, Colwall, Cowleigh, &c.

LEONTODON. Dandelion. *L. Taraxacum* and *palustre*.

APARGIA. Hawkbit. *A. hispida* and *autumnalis*. In pastures.

THRINCIA. *T. hirta*. Hairy Thrincia. Moory spots.

HIERACIUM. *H. Pilosella*. Mouse-ear hawkweed. Plentiful.

Var. *brevicaulis*, very small, with short scape. On the summit of the Herefordshire Beacon.

*H. murorum*. Wall hawkweed. Rocks near the Wych, where a variety occurs with one flower, and abortive branches on the stem. More luxuriant on Little Malvern Church.

*H. sylvaticum*. Wood hawkweed,  $\alpha$ . &  $\beta$ . The first is a smaller plant than *murorum*, with three or four slightly hairy ovate-lanceolate leaves on the stem, with short hairy petioles, becoming sessile at the summit. By no means so densely glandulose on the calyx and peduncles as *H. murorum*. In rocky woods about the northern end of the chain.  $\beta$ . is taller, the base of the sessile leaves of stem and petioles of radical leaves very hairy. In the wood near Walm's Well, western base of Herefordshire Beacon.

*H. boreale*. Northern hawkweed. This is a tall and handsome plant, very slender, with branched corymbs of conspicuous flowers; but growing only in shady places. *H. subaudum* of Smith. At Hanley, and about Ledbury. Also in Rough Hill Wood and Crumpend.

*H. umbellatum*. Narrow-leaved hawkweed. Rare. In Crows'-Nest Wood, St. John's. I have not seen it elsewhere.

CREPIS. *C. tectorum*. Smooth hawk's-beard. Common.

HYPOCHÆRIS. *H. glabra*. Smooth cat's-ear. In damp boggy spots about the eastern base of the hills.

*H. radicata*. Long-rooted cat's-ear. Common.

LAPSANA. *L. communis*. Nipplewort. Plentiful.

CICHORIUM. *C. Intybus*. Wild succory. Castle Morton.

ARCTIUM. Burdock. *A. Lappa* and *Bardana*. Both common.

SERRATULA. *S. tinctoria*. Common saw-wort. Woods.

CARDUUS. Thistle. *C. nutans*, *acanthoides*, *Marianus*.

The Musk-thistle (*C. nutans*) is sometimes found on the hills with cream-coloured flowers, when it is peculiarly elegant.

CNICUS. Plume-thistle. *C. lanceolatus*, *palustris*, *arvensis*, *eriophorus*, *pratensis*, *acaulis*. The woolly-headed plume-thistle (*C. eriophorus*) is rare, but occurs on the calcareous strata at Colwall. *C. pratensis* is only found in wet meadows by Longdon Marsh. *C. acaulis* on the commons at the eastern base of the hills.

ONOPORDUM. *O. Acanthium*. Cotton thistle. Near Welland Church, and towards the Old Hills, Powick.

CARLINA. *C. vulgaris*. Carlina thistle. Common on the hills, to their summits; but very dwarf in the latter position, the root becoming longer than the stem.

BIDENS. Bur-marigold. *B. cernua* and *tripartita*. Wet spots and pools on the commons. Also near Upton-on-Severn.

EUPATORIUM. *E. cannabinum*. Hemp agrimony. In wet places.

TANACETUM. *T. vulgare*. Common tansy. Near the Obelisk, Eastnor; also at Cowleigh, &c. On the banks of the Teme and Severn.

ARTEMISIA. Wormwood and mugwort. *A. Absinthium* and *vulgaris*.

GNAPHALIUM. *G. sylvaticum*. Highland cudweed. On the End Hill most abundantly in 1841, several hundred specimens growing together.\* Also by the side of the road near North Cottage, Malvern Wells.

*G. uliginosum*. Marsh cudweed. In dry ditches.

*G. minimum*. Least cudweed. On the hills in various spots.

*G. Germanicum*. Common cudweed. About the bases of the hills.

*β. densum*, very dwarf, with aggregated flowers, cal. very woolly, and branches *not proliferous*. Occurs on the Common near the Firs.

CONYZA. *C. squarrosa*. Ploughman's spikenard. Base of Ragged-stone Hill. The Croft, Cowleigh, &c.

ERIGERON. *E. acris*. Blue flea-bane. Rare. On old walls at Leigh, on the northern side of the churchyard.

TUSSILAGO. *T. Farfara*. Colt's-foot. Too abundant.

PETASITES. *P. vulgaris*. Butterbur. Sides of brooks. River Teme.

SENECIO. *S. vulgaris*. Common groundsel.

*S. sylvaticus*. Mountain groundsel. H. Abundant.

*S. squalidus*. Inelegant ragwort. Formerly on old buttresses, near "Betty's Boat," the Priory Ferry, Worcester. Here the plant flourished till 1847, when a new esplanade was made along the shore of the river, and the Rev. Canon Wood's house built. The old massive walls were then scraped, and the *Senecio* obliterated. It now only

\* Radical leaves longest, all green on their upper sides; but being amplexicaul at their bases, and growing involutely around the stem, their silvery under surfaces only are visible, thus giving a most elegant appearance to the plant when in flower, the white leaves contrasting with the glossy brown of the involucre.

grows on the wall of Mr. Dolvere's (the sexton to the cathedral) garden, not far from the spot where, it appears from a note-book in the possession of my friend the Rev. J. H. Thompson, it was observed by the late Rev. T. Shirley in 1801.

*S. erucæfolius*. Hoary ragwort. Roadsides, &c. Var. *non radiata*.

*S. Jacobæa*. Common ragwort. Sides of hedges and woods.

*S. erraticus*. Straggling ragwort. Lower leaves petiolate, incised-dentate, the terminal lobe very large, ovate. At New Pool, Malvern Chase.

*S. aquaticus*. Marsh ragwort. Longdon Marsh, &c.

SOLIDAGO. *S. Virgaurea*. Common golden rod. H.

PULICARIA. *P. dysenterica*. Common flea-bane. Roadsides.

*P. vulgaris*. Small flea-bane. Foliage very strong-scented. In watery spots on Barnard's Green, &c.

BELLIS. *B. perennis*. Day's-eye. Var. *uniflora*, very small. Also var. *non-radiata*, and var. *non-discoidea*, the latter all radiant florets.

CHRYSANTHEMUM. Ox-eye. *C. Leucanthemum* and *segetum*.

PYRETHRUM. Feverfew. *P. Parthenium* and *inodorum*.

MATRICARIA. *M. Chamomilla*. Wild chamomile. Waste spots.

ANTHEMIS. *A. nobilis*. Medicinal chamomile. Abundant on Barnard's Green and Welland Common; Seats Common, Wells.

*A. arvensis*. Corn chamomile. Foliage clothed with scattered white hairs, slightly fragrant, curling up and crisp in drying. Near Cowleigh Park; and in fallow fields about the Berrow, plentiful.

*A. Cotula*. Fetid chamomile. In various waste spots.

ACHILLEA. *A. Ptarmica*. Sneezewort yarrow. Moist pastures.

*A. Millefolium*. Common yarrow. Of general occurrence.

CENTAUREA. Knapweed. *C. nigra*. Black knapweed. Common in pastures. Also *β. radiata*. This variety (?), the *C. nigrescens* of some authors, occurs very fine about Malvern; but the large rayed heads appear to be the only distinction between it and the common *nigra*.

*C. Scabiosa*. Greater knapweed. Plentiful about the Croft Lime-works, and at Colwall and Longdon.

*C. Cyanus*. Corn bluebottle. In cornfields.

## MONÆCIA.

EUPHORBIA. Spurge. *E. helioscopia*, *exigua*, *Peplus*, *amygdaloides*. The latter profusely covers the exposed declivities of the hills, giving a delicate light-green tint to them in early summer, before the brake (which is afterwards so characteristic) has sufficiently unfolded itself.



CALLITRICHE. Water starwort. *C. verna*. Fruit nearly or quite sessile; styles erect; bracts falcate. Common in ditches.

*C. pedunculata*. Fruit stalked on the lower part of the stem, obtusely keeled at the back; styles reflexed; bracts none. In pools on Danemoor, Welland Common.

ALNUS. *A. glutinosa*. Common alder. Forming dwarf "alder holts" in many spots at the bases of the hills, shadowing over the various rivulets with an embowering cloak, as they emerge from the ravines.

URTICA. *U. urens*. Small nettle.

*U. dioica*. Common nettle. Two curious varieties occur—

Var. *β. supra-armata*. Stem, petioles, and clusters, with excessively numerous and developed horrent spines. On the very summit of the Herefordshire Beacon.

Var. *γ. gracillima*. Leaves pendent, lanceolate, on long petioles, very graceful in aspect; flowers pendent, distant, on long peduncles. In a hedge below the Holy Well.

BRYONIA. *B. dioica*. Red-berried bryony. Not uncommon.

CERATOPHYLLUM. *C. demersum*. Armed hornwort. Longdon Marsh.

*C. submersum*. Unarmed hornwort. Pools on Welland Common.

MYRIOPHYLLUM. *M. spicatum*. Spiked water-milfoil. Spike erect when in bud. In various pools and marshy spots.

*M. alterniflorum*. Alternate-flowered water-milfoil. Sterile flowers alternate, forming a leafless spike, nodding when in bud, afterwards erect; fertile one in axillary whorls at the base of the spike. In little pools on Welland Common.

*M. verticillatum*. Whorled water-milfoil. In the Teme.

POTERIUM. *P. Sanguisorba*. Salad Burnet. Calc. strata. E. and W.

QUERCUS. *Q. Robur*. Common British oak. Young branches glabrous; leaves on short foot-stalks, slightly pubescent beneath; female catkins on very long peduncles. Common in all the woods, and forming the largest and oldest trees.

*Q. intermedia*. (Don.) Intermediate oak. Young branches glabrous; leaves on long foot-stalks, slightly pinnatifid, glaucous, and clothed with fine starry pubescence beneath; female catkins on very short peduncles; fruit oblong. Some fine spreading trees of this form occur on a detached syenitic spur in Cowleigh Park, and one of them has its leaves *variegated with white*. It is remarkable that a hamlet

called "*the White-leaved Oak*" occupies a glen between the Ragged-stone and Keysend Hills, no doubt derivable from a remarkable oak of this variety which formerly existed there, though I was informed by a rustic that it had been long ago cut down. My specimens agree with the *intermedia* of Leighton, *Flor. Shrop.*, received from the author.

*Q. sessiliflora.* (*Salisb.*) Sessile-fruited oak. Young branches pubescent; leaves on long foot-stalks, oblong, pinnatifid, glabrous beneath; female catkins sessile; fruit ovate. I have generally observed this as forming grotesque and deformed trees in old hedges and holloways, where, being pollarded, it is very rugged and enduring. It appears never to rival the herculean grandeur of *Q. Robur*—

"Where up the sunny banks  
The trees retire in scatter'd ranks;  
Save where, advanc'd before the rest,  
On knoll or hillock rears his crest,  
Lonely and huge, the GIANT OAK."  
SCOTT.

BETULA. *B. alba.* Common birch. In moist woods.

Var. *β. pendula.* Weeping birch. This variety occurs in several woods where the trees are old.

CARPINUS. *C. Betulus.* Hornbeam. Hill-side at the Wells, but probably planted there. Not indigenous to Worcestershire.

CORYLUS. *C. Avellana.* Hazel. Woods and coppices.

N.B. I have never observed the beech growing wild in this district.

## DIECIA.

SALIX. Willow, Sallow, and Osier. The following species occur in various places between the hills and the Severn: *S. purpurea*, *Helix*, *undulata*, *triandra*, *amygdalina*, *decipiens*, *fragilis*, *Russelliana*, *alba*, *vitellina*, *viminalis*, *stipularis*, *Smithiana*, *acuminata*, *cinerea*, *aquatica*, *aurita*, *oleifolia*, *caprea*.

VISCUM. *V. album.* Mistletoe. This truly parasitical plant may be found about the Malvern range on the following trees: apple, pear, hawthorn, maple, lime, ash, willow, mountain-ash, service, white poplar, aspen, *Robinia Pseud-acacia*, elm, hazel, and oak. It is, however, *very rare* on the three last-named trees. A fine young oak on the western side of the Ridgeway in Eastnor Park is adorned with large bushes of mistletoe near the summit of the tree. It is remarkable, however, that this plant is most common on young black poplars, *P. nigra*; for

wherever the poplar is planted, it is certain in a few years to be infested with the mistletoe. The Rev. Canon Cradock has kindly informed me of two oaks in the parish of Tedstone, near Knightsford Bridge, that have mistletoe upon them.\*

HUMULUS. *H. Lupulus*. Common hop. In hedges.

POPULUS. Poplar. *P. alba, tremula, nigra*. The white and grey poplars (not specifically distinct) form apparently natural clumps in wet spots, as at New Pool, Longdon Marsh, &c. Old pollard black poplars, of scraggy aspect, occur by brook-sides.

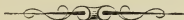
MERCURIALIS. *M. perennis*. Dog's mercury.

JUNIPERUS. *J. communis*. Common juniper. Edges of woods on the limestone hills near the Croft, Mathon; also on the Ridgeway, Eastnor Park. Plentiful at Bush Hill, Powick.

TAXUS. *T. baccata*. Yew-tree. In a thick wood among old hollies on the Holly-bush Hill, and in the woods on the calcareous soil on the western side of the hills; darkening horribly a part of the Ridgeway in Eastnor Park.

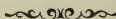
ATRIPLEX. Orache. *A. patula, deltoidea, angustifolia*, and *erecta*. Also the var. of *A. deltoidea* called *β. microsperma*.

\* For a full account of the parasitic growth of the *Mistletoe*, the localities of remarkable trees on which it grows, and the ancient and modern observances connected with it, see the author's *Botanical Looker-Out*, 2d edit. pp. 41-56.



## DIVISION II.

### MONOCOTYLEDONOUS OR ENDOGENOUS PLANTS.



“ Oh lead me forth o’er dales and meads,  
E’en as her child the mother leads;  
Where blooming clover grows, and where  
Appears with scented foot the hare;  
Where twin-nuts cluster thick, and springs  
The thistle with ten thousand stings;  
Untrodden flowers, and unprun’d trees,  
Gladden’d with songs of birds and bees;  
The ring where last the fairies danc’d—  
The place where dank Will latest glanc’d—  
The stream that steals its way along  
To glory consecrate by song:  
And while we saunter, let thy speech  
God’s glory and his goodness preach.”

ALLAN CUNNINGHAM.

### DIANDRIA.

LEMNA. Duckweed. *L. trisulca*, *minor*, *polyrhiza*, *gibba*. The last is rare, but may be found in ditches bounding the common between Barnard’s Green and Maddresfield. Abundant also near Powick.

### TRIANDRIA.

IRIS. *I. Pseudacorus*. Yellow flag. In marshes in the flat country eastward, but not near the hills.

*I. foetidissima*. Gladwyn, or roast-beef plant. Flowers dingy purple. In a wood on the Little Storage, about four miles north of Great Malvern. Abundant in Swain’s Bank Coppice, Powick; also on Berrow Hill, three miles east of the Raggedstone Hill. On Sarn Hill, Bushley, there are absolute thickets of it.

ISOLEPIS. *I. setacea*. Bristle-stalked club-rush. On plashy por-

tions of the commons at the eastern bases of the hills. High Wood, Alfrick.

ELEOGITON. *E. fluitans*. Floating spike-rush. Pools. E.

BLYSMUS. *B. compressus*. Broad-leaved Blysmus. Abundant on the margin of springy spots on the hills, especially about the Wells.

ELEOCHARIS. Spike-rush. *E. palustris*. Pools. Common.

*E. multicaulis*. In marshy spots on Castle Morton Common.

*E. acicularis*. Least spike-rush. In various damp marshy places on Barnard's Green and Welland Common. Plentiful on the edge of Garret Pool.

SCIRPUS. *S. maritimus*. Salt-marsh club-rush. In several ditches about Longdon Marsh. Rare.

*S. sylvaticus*. Wood club-rush. Chalybeate Pool; Severn side.

*S. lacustris*. In the Ledden, near Ledbury.

*S. pauciflorus*. In shallow pools and boggy places on Castle-Morton Common.

ERIOPHORUM. *E. pubescens*. Downy-stalked cotton-grass. Spikes at first upright, pedicels downy or rough. Plentiful in a little boggy field near the roadside, a short distance north of Brand Lodge, on the Colwall side of the hills. W. Banks of Sapey Brook, Tedstone, Herefordshire.

*E. angustifolium*. Narrow-leaved cotton-grass. In the bog near Brand Lodge, and Keysend Hill Bog. Down very long and silky. A very elegant family, presenting to the eye, when numerous, the appearance of fresh-fallen snow amidst the viridescence of summer.

Var. *β. polystachion*. This formerly grew on the bog at the western base of the Worcestershire Beacon, now cut through by the new road; but thoughtless collectors, too rapacious, have eradicated it there.

### GRAMINEÆ.

The Grasses, constituting the Natural Order GRAMINEÆ, all belong to *Triandria-Digynia*, except the Vernal-grass, which has but two stamens. Of these I think it sufficient to give a catalogue only of all that occur on the hills, and in the country between them and the Severn, with the letter R. annexed when not common. The turf of the hills is composed chiefly of *Anthoxanthum odoratum*, *Agrostis canina* and *vulgaris*, *Aira præcox* and *flexuosa*, *Festuca ovina*, and *Avena flavescens*.

ANTHOXANTHUM—*odoratum*.

NARDUS—*stricta*. On Barnard's Green, &c.

ALOPECURUS—*pratensis*, *agrestis*, *geniculatus*, *fulvus*. The last dis-



tinguished by its short awn, only the length of the calyx, grows on the borders of New Pool.

PHALARIS—*Canariensis*, *arundinacea*. The former naturalised.

PHLEUM—*pratense*. Cat's-tail grass. Damp meadows.

MILIUM—*effusum*. In shady woods.

GASTRIDIDIUM—*lendigerum*, R. E. Sarn Hill, near Longdon.

CALAMAGROSTIS—*Epigejos*. Filling a wet field at the Berrow.

AGROSTIS—*canina*, *vulgaris*, *alba*. The last at Longdon.

CATABROSA—*aquatica*, R. Western side.

AIRA—*cristata*, R., *cæspitosa*,\* *flexuosa*, *caryophyllea*, R., *præcox*.

*A. cristata* grows on the Raggedstone Hill.

MOLINIA—*cærulea*. Rare. Crow's-nest Wood.

MELICA—*uniflora*. In woody places.

HOLCUS—*mollis*, *lanatus*.

ARRHENATHERUM—*avenaceum*. Very common in fields.

POA—*aquatica*, R., *fluitans*,\* *rigida*, *compressa*, *trivialis*, *pratensis*, *annua*, *nemoralis*. The latter in holloways near the Wells.

TRIODIA—*decumbens*. Worcestershire Beacon. Malvern Chace.

BRIZA—*media*. A curious variety, which may be called *abortiva*, with ovate spikelets of about five abortive florets, and a flexuous wiry panicle of few flowers, grows in the bog at the base of the Worcestershire Beacon.

DACTYLIS—*glomerata*.

CYNOSURUS—*cristatus*.

FESTUCA—*ovina*, *duriuscula*, *bromoides*, R., *Myurus*, *lohiacea*, *pratensis*, *elatior*, R.

BROMUS—*giganteus*, *asper*, *sterilis*, *secalinus*, *commutatus*, *mollis*, *racemosus*, *erectus*, R. *B. giganteus* and *erectus* occur chiefly in the woods on the calcareous strata. *B. erectus* is plentiful on the Ridgeway.

AVENA—*fatua*, *flavescens*, *pratensis*, *pubescens*. The last on the side of the Ridgeway, Eastnor Park.

ARUNDO—*Phragmites*. Abundant in Longdon Marsh, where I have also gathered a variegated form like the garden ribbon-grass.

ELYMUS—*Europæus*, R. In several of the western woods.

\* This grass grows very tall and luxuriant in woods after a fall of coppice, and chokes up many other things,—becoming, in fact, a nuisance. The flowering culms, however, if carefully cut by boys or girls in the autumnal season, after harvest, might, I am persuaded, be turned to good economical account. Indeed, I have seen bundles of them used as thatch for out-buildings of cottages, and they seemed to answer the purpose very fairly.

HORDEUM—*murinum*, *pratense*.

TRITICUM—*caninum*, *repens*.

BRACHYPODIUM—*sylvaticum*, *pinnatum*.

LOLIUM—*perenne*, *temulentum*, R., *multiflorum*. The last in cultivated fields, and doubtless introduced.

### TETRANDRIA.

POTAMOGETON. Pondweed. *P. pectinatus*. Fennel-leaved pondweed. Various pools, and in the river Teme.

*P. gramineus*. Grassy pondweed. In streams communicating with Longdon Marsh.

*P. crispus*. Curled pondweed. In New Pool, &c. Common.

*P. perfoliatus*. Perfoliate pondweed. In the rivers Teme and Severn.

*P. heterophyllus*. (?) Various-leaved pondweed. In a pool on Welland Common.

*P. praelongus*. Leaves pellucid, lanceolate, elongate, with a single broad striated midrib entire, narrowed but sheathing at the base; stem long, with proliferous branches of dense foliage extending on all sides under water. In a pool on Barnard's Green, below Devil's Oak Lane.

*P. natans*. Broad-leaved floating pondweed. Pools. Common.

### HEXANDRIA.

GALANTHUS. *G. nivalis*. Snowdrop. Plentiful in a little meadow at the northern base of the Herefordshire Beacon, below the Ledbury Road, between Winds' Point and the entrance-lodge at Eastnor Park. This meadow is bounded on one side by a wood, in which also are many snowdrops, and the whole appear perfectly wild. Near the Wintal Farm, Cradley (Dr. Addison).

NARCISSUS. *N. Pseudo-narcissus*. Wild daffodil. Abundant and very beautiful in New's Wood, and several others about Little Malvern; as well as in most of the flat meadows southward to the end of the chain. Covering meadows of virgin turf at Cradley, as well as between Chance's Pitch and Ledbury; also near High Grove, Mathon.\*

*N. biflorus*. Pale two-flowered Narcissus. Rare. In orchards at the Berrow, and near Ledbury; banks of Sapey Brook.

\* *N. incomparabilis* has been stated to be naturalised in some places about Malvern, by my late friend, J. Roby, Esq.

ALLIUM. *A. oleraceum*. Streaked field garlic. Rare. In a field by the side of Sandy Lane, Alfrick (Miss Moseley).

*A. vineale*. Crow garlic. Borders of the fields about Malvern Wells and Hanley. Also near Powick, plentiful.

*A. ursinum*. Ramsons, or broad-leaved garlic. Moist woods.

ORNITHOGALUM. *O. umbellatum*. Umbelled Bethlehem star. At Cotheridge, north of Great Malvern. From John Walcot, Esq.

HYACINTHUS. *H. non-scriptus*. Common blue-bell.

TULIPA. *T. sylvestris*. Wild tulip. In an abandoned limestone-quarry at Mathon; gathered there by my late brother, *James Teverill Goodman*. Also on a marl-bank close to the Severn, at the Ketch. On the eastern side of Pitchcroft Ham, Worcester.

JUNCUS. Rush. *J. effusus, conglomeratus, acutiflorus, lampocarpus, obtusiflorus, glaucus, uliginosus, compressus, bufonius*. *J. obtusiflorus* grows in the Welland Marshes.

LUZULA. Wood-rush. *L. sylvatica, pilosa, Forsteri, campestris, congesta*. *L. Forsteri* in the Wells Copse, and at Little Malvern.

TRIGLOCHIN. *T. palustre*. Marsh arrow-grass. In boggy spots about the base of the hills; not uncommon.

COLCHICUM. *C. autumnale*. Meadow saffron. In meadows about Ledbury, the Wells, Blackmore Park, Leigh Sinton, &c., and also in woods at Mathon and Colwall. E. and W.

ALISMA. *A. Plantago*. Great water plantain. In pools.

## OCTANDRIA.

PARIS. *P. quadrifolia*. Four-leaved Paris. In most of the shady woods on both sides of the hills; often with five or six leaves.

## ENNEANDRIA.

BUTOMUS. *B. umbellatus*. Flowering rush. Rare. Castle Morton, bordering on Longdon Marsh; Laughern Brook, Worcester.

## GYNANDRIA.

ORCHIDEÆ. ORCHIS. *O. Morio*. Green-winged meadow orchis. In dry upland meadows about Colwall, the base of the Old Storage, and in pastures below Malvern Wells, &c.; abundant, with several varieties of colour. E. and W.

*O. mascula*. Spring purple-spotted orchis. Common in woody places. A beautiful white-flowered variety, "*immaculata*," with unspotted leaves, occurred in Mill Copse, Cowleigh, in 1851, when botan-

ising with the Revs. Lister Isaac and J. H. Thompson. The root was taken up, and it flowered the following year in Mr. Thompson's garden, *immaculate* as the worthy botanist who suggested the name.

*O. ustulata*. Dwarf dark-winged orchis. Rare. Specimens of this orchis gathered near the Berrow Hill, four miles south-east of Little Malvern, were shown me in 1849 by my late lamented friend, John Roby, Esq., who perished in the wreck of the "Sirius" the following year. It may be found also in the field close to Hopton Court, Leigh, on the bank of the brook where it enters the field (Miss Moseley).

*O. latifolia*. Marsh orchis. Not common. In the dingle between Midsummer and Hollybush Hills. Growing fine in Longdon Marsh.

*O. maculata*. Spotted palmate orchis. Wet spots; common.

*O. pyramidalis*. Pyramidal orchis. On the margin of the woods near the Croft Lime Works, Mathon, and at Leigh Sinton. A white variety occurs near the Croft; and when in July the elegant marbled butterfly is fluttering about these beautiful *Orchideæ*, the picture is exciting to a lover of nature's harmonies.

GYMNADENIA. *G. conopsea*. Fragrant conops-like orchis. In meadows below Seats Common, Malvern Wells, and in the Welland Marshes. Also in fields near Whippet's Brook, by the footpath to Leigh Sinton.

HABENARIA. *H. viridis*. Green or frog orchis. Moist meadows.

*H. chlorantha*. Large butterfly orchis. Woods on the limestone.

*H. bifolia*. Small fragrant butterfly orchis. Open pastures. E. and W. Rather rare.

Between these two plants a considerable general resemblance exists, but *bifolia* is a much smaller plant, *always* very sweet-scented, growing on grassy slopes; while *chlorantha* is mostly confined to woods, where it grows two feet high or more, with the lateral petals wider, and spur longer. The last is plentiful on the side of the Ridgeway.

OPHRYS. *O. apifera*. Bee ophrys. About the vicinity of the Croft and Leigh Sinton Lime-works. At Tedstone, near Sapey Brook.

NEOTTIA. *N. spiralis*. Fragrant Lady's traces. Boggy spots on the commons near Little Malvern and Castle Morton.

LISTERA. *L. ovata*. Common tway-blade. Woods.

*L. Nidus-avis*. Bird's-nest orchis. A brown parasitical-looking plant. In shady woods westward. Rare. Under oaks in Eastnor Park, between the second lodge and the obelisk. Also in woods towards Cradley. In the Gullet Wood, near Holly Bush.

EPIPACTIS. *E. latifolia*. Broad-leaved helleborine. In most of the western woods. Also in Cowleigh Park, and at Tedstone.

*E. purpurata*. (*E. media*,  $\beta$ . Bab.) Purple-leaved helleborine. Stated by Sir J. E. Smith to have been found in a wood near the Norris, Leigh, by Dr. Abbot. It now grows in the Folly Coppice, Alfrick, exactly opposite to Broadwas Court, a short distance from the Teme. Here I have observed it so intertwined with the roots of trees as to be almost inextricable.

*E. palustris*. Marsh helleborine. In wet meadows at Hanley (Mr. Ballard, in Withering's Botany). Plentiful at Tedstone on the banks of Sapey Brook, shown me by the Rev. Canon Cradock.

### MONÆCIA.

ZANNICHELLIA. *Z. palustris*. Horned pondweed. Pools on Wel-land Common.

TYPHA. *T. latifolia*. Great reedmace. Catkins continuous.

*T. angustifolia*. Narrow-leaved reedmace. Catkins separated. Abundant at New Pool, Malvern Chace.

SPARGANIUM. Bur reed. *S. simplex*, *ramosum*, *natans*. I have received undoubted specimens of the latter from John Walcot, Esq., gathered by him from muddy pools at Cotheridge.

CARICEÆ. CAREX. *Seg* or *sedge*. For full descriptions of the species I refer to Hooker and Babington. With regard to locality, the bogs about the bases of the hills are the most favourable spots; but a few are confined to the flat eastern commons, or the pools dotting them.

#### *Style bifid.*

*C. dioica*, R., *pulicaris*, R., *intermedia*, *vulpina*, *muricata*, *vulgaris*, *divulsa*, *ovalis*,\* *remota*, *axillaris*, R., *stellulata*, *cæspitosa*, *acuta*.

N.B. *C. intermedia* fills whole fields on the borders of Longdon Marsh, where also the rare *C. distans* occurs.

#### *Style trifid.*

*C. paludosa*, *riparia*, *vesicaria*, R., *ampullacea*, R., *hirta*, *glauca*, *pendula*, *Pseudo-cyperus*, *sylvatica*, *strigosa*, *binervis*, R., *distans*, R., *fulva*, *pallescent*, *flava*, *Æderi*, *præcox*, *pilulifera*, R., *panicea*.

\* A curious variety of *C. ovalis*, with long bracteas, occurs on a spot where water stagnates on Seats Common, below Malvern Wells. This, Mr. S. Gibson, who has paid much attention to the Carices, calls Var.  $\beta$  *bractæata*; and in the *Phytologist*, i. 716, it is distinguished as *Carex Malvernensis*; while in *Phyt.* ii. 751, it is doubtfully considered to be *C. argyroglochin*.



*C. Pseudo-cyperus* grows very luxuriant by the side of the road between Newland and Powick, on ditch-banks. *C. binervis* is found at Danemoor Pool. *C. strigosa* on the banks of Sapey Brook.

ARUM. *A. maculatum*. Cuckoo-pint. Lords and Ladies.

#### DIECIA.

TAMUS. *T. communis*. Black bryony. Common.

Var.  $\beta$ . *purpurea*. With leaves purple or almost black, paler beneath, stem brown. Growing in the hedge of a lane leading from the Warren Hill to the Ridgeway.

HYDROCHARIS. *H. Morsus-Ranæ*. Frog-bit water-lily. Leaves reniform, floating; flowers pedicelled, rising above the water, white and very delicate. Pools. E. Near Upton, and in little ponds at Bromwich near Worcester, not far from the Severn.



## DIVISION III.

### CRYPTOGAMOUS PLANTS.



“The common, overgrown with *Fern*, and rough  
With prickly Gorse, that, shapeless and deform'd,  
And dang'rous to the touch, has yet its bloom,  
And decks itself with ornaments of gold,  
Yields no unpleasing ramble; there the turf  
Smells fresh, and, rich in odoriferous herbs,  
And *fungous fruits of earth*, regales the sense  
With luxury of unexpected sweets.”

COWPER.

### CHARACEÆ.

CHARA. *C. flexilis*. Flaccid Chara. Floating in great abundance in pools on Castle Morton Common.

*C. vulgaris*. Common Chara. Pools and bog-holes.

*C. hispida*. Prickly Chara. Ditches of Longdon Marsh.

The circulation in these curious aquatic plants is well shown by a powerful microscope, for which purpose the plant should be kept fresh in a phial of water. Though modern botanists place this little family now among the *Cryptogamia*, it seems an unsatisfactory position.

### EQUISETACEÆ.

EQUISETUM. Horse-tail. *E. fluviatile* (*Telmateia*, Ehrh.), *arvense*, *sylvaticum*, R., *limosum*, *palustre*. The latter in bogs.

I have gathered a var. prolif. of *E. fluviatile*, leafy and in fruit, the catkin topped by a prolongation of the frond, by the side of a copse near the Chalybeate Spa, 1841, where the plant is abundant.

## FILICES—FERNS.

FILICES ANNULATÆ. Thecæ provided with an elastic marginal ring, by the operation of which the cups containing the seeds are torn asunder, and the seeds dispersed.

Fam. I.—*Adiantaceæ*.

BLECHNUM. *B. boreale*. Northern hard fern. On boggy ground about the hills. The barren fronds have a peculiarly rigid aspect.

PTERIS. *P. aquilina*. Common or eagle brake. Abundant. On the hills it scarcely exceeds a foot in height, and withers with the first frosts; but in May and June its pale-green fronds have a very fresh inviting aspect. In the russet-brown of its autumnal garb, its stiff masses well contrast with the green gorse and its golden flowers, forming a wild foreground not easily exceeded in nature's true harmonies. Late in the autumn the brakes on the hill are generally mown down with the scythe, formed into bundles on the higher acclivities, and rolled down their sides. Here they are stacked as litter for pigs, donkeys, &c., or sometimes thrown into the oven or on the fire, as a fierce but quickly-spent fuel.

Fam. II.—*Polypodiaceæ*.

ALLOSORUS. *A. crispus*. Parsley-leaved rock-fern. Rare. In the fissure of a crumbling rock, on one of the eastern buttresses of the Herefordshire Beacon, above the Priory Farm, Little Malvern. It occurs nowhere else on the range.

POLYPODIUM. *P. vulgare*. Common polypody. Small on the rocks, but larger, bilobated, and with serrated pinnules, in several shady lanes.

*P. Dryopteris*. Tender three-branched polypody. Rare. Among fallen fragments of rock in the glen between the North and End Hills. A very tender and beautiful bright-green fern, but withering with the first hot days of July, so that it is difficult after that time to get good specimens without uplifting the broken rocks.

I have gathered, growing in the above spot with *P. Dryopteris*, a fern that has been called *P. calcareum* by several botanists, but which appears to me to be really *intermediate* between the very rigid form of *P. calcareum* of other localities, and the tender, less luxuriant *P. Dryopteris*. It therefore deserves to be distinguished, though never attaining the rigidity and height of the specimens I have gathered among the back-broken recesses of the stony Cotswolds, with my intelligent friend

Professor Buckman, F.G.S., the recorder of the Flora of those blustrous wilds.

*Fam. III.—Aspidiaceæ.*

ASPIDIUM. *A. aculeatum*. Soft prickly shield-fern. Common in the lanes about the hills.

*A. angulare*. Angular-leaved shield-fern. This appears to differ from the above in its broader frond and more decidedly petioled pinnules, which are also more auricled and deeply cut, the lower ones next the main rachis being deeply pinnatifid, or sometimes pinnate. It is probable that situation and luxuriance of growth cause the difference. This is found on the Holly-bush Hill, and in stony lanes about Cradley, Old Storage, &c.

*A. lobatum*. Close-leaved prickly shield-fern. The crispness and close growth of the pinnules of this beautiful fern distinguish it at a glance from either of the preceding. About the base of the Holly-bush Hill, and in lanes overgrown with bushes, &c., on both sides of the hills.

LASTRÆA. *L. Oreopteris*. Fragrant heath shield-fern. Plentiful at the lower end of the bog at the western base of the Worcestershire Beacon; on the margin of a bog beyond "the White-leaved Oak;" on the eastern side of the Herefordshire Beacon; as well as on the margin of rills on the commons below Malvern Wells.

*L. Filix-mas*. Male shield-fern. Common and large.

*L. dilatata*. Broad drooping wood-fern. Dwarf and rigid on the hills, tall and drooping in the woods. This is a most variable plant in size, aspect, and luxuriance, and appears in its most developed form only in wet alder-holts, and about the roots of trees in springy spots, where it appears "stooping as if to drink," and Niobe-like, bending into the water. The variety on the hills is called *spinulosa* by some botanists; but I think it merely dwarf from exposure.

*L. spinulosa*. Prickly-toothed wood-fern. Less luxuriant, and more triangular in the shape of the frond than the above, of which, nevertheless, it may be a variety. In the dry parts of the western woods.

*Fam. IV.—Aspleniaceæ.*

ATHYRIUM. *A. Filix-fœmina*. Lady-fern. Common both in wet and dry spots. Generally the under side of the frond is perfectly brown throughout with sori, stiff and inelegant. In moist spots varieties occur with a very thick sulcated rachis. On the Herefordshire Beacon this fern has a pretty appearance in early summer; the old fronds have then

fallen gracefully down in a brown circle, from the midst of which the new ones unfurl in the most elegant manner.

ASPLENIUM. *A. Adiantum-nigrum*. Black-stalked spleenwort. Common on the rocks: often variegated.

*A. Ruta-muraria*. Wall-rue spleenwort. On stone walls.

*A. viride*. Green spleenwort. Rare. This only occurs on Ham Bridge, across the Teme, eight miles north of Great Malvern. The locality is very curious.

*A. Trichomanes*. Common spleenwort. In crevices among the shady rocks of the hills.

SCOLOPENDRIUM. *S. vulgare*. Hart's-tongue. Common.

*β. multifidum*. On Rosebury Rock on the Teme, near Knightsford, I have\*gathered fronds eighteen inches long, and so strangely multifid as to have quite a demoniacal aspect.

#### *Fam. V.—Grammitideæ.*

GRAMMITIS. *G. Ceterach*. Scaly hart's-tongue. Rare in this district, not growing on any of the rocks of the hills, but sparingly on a lofty stone wall close to the road at Great Malvern, near the entrance of Holly Lodge (now destroyed). On the Abbey Church also, according to Mr. Newman, but not plentiful there. On a brick wall at Forthampton.

FILICES EXANNULATÆ. Thecæ unprovided with an elastic marginal ring.

#### *Ophioglossaceæ.*

OPHIOGLOSSUM. *O. vulgatum*. Common adder's-tongue. Frond ovate leaf-like, with anastomising veins, and an erect club-shaped spike issuing from its base. On the turf near the entrance of Purlieu Lane, 1850. Abundant on the southern side of Longdon Marsh.

BOTRYCHIUM. *B. Lunaria*. Moonwort. Rare. In a field on the north side of the road at the base of the Herefordshire Beacon, west of Winds' Point.

No species of *Lycopodium* has yet been met with in this district.

#### MUSCI—MOSESSES.

The Mosses, denominated by Linnæus "*Servi*," or humble handmaids in the economy of Nature, have exercised a considerable agency in the accumulation of the soil now upon the Malvern Hills; doubtless, indeed, they were the primary originators of vegetation upon the bare rocks, whose hollows they have filled up in the lapse of ages with a soft



spongy carpet, and so encompassed and obscured them, that numerous masses of grey rock, almost immersed in the verdant mossy inundation, now scarcely exhibit their points above it. The *lichens* have been generally considered as the first pioneers of vegetation, but their efforts to create a *humus* for the nourishment of other plants are but trifling when compared with the economical powers of the mosses. To test this by experiment, I took a tuft of *Bryum capillare*, Linn., from the roof of an outhouse at Malvern Wells, which was abundantly studded with it, together with the black earth collected about its base. The mass altogether weighed six ounces, but when after repeated and careful washings I had extracted all, or nearly all, the black mould that enveloped the roots, the actual residuum of frondescence that remained when weighed amounted only to half an ounce; thus satisfactorily showing that the moss, through atmospherical and imbral agency, had formed a soil exceeding its own weight at the very least above ten times! I had reason to believe, too, that this had been accomplished within three, or four years at most. By operations on a more extensive scale, it is easily conceivable how a bare mass of rock may, in the course of a few years, be covered with a thick coating of soil sufficient for the nourishment of any of the phanerogamous species, adapted to the climate and elevation where they may stand. *Bryum hornum* has been noticed to be a great accumulator of soil in marshy spots; while the excessive growth alone of such mosses as *Sphagnum palustre*, *Dicranum glaucum*, *Bryum palustre*, *Hypnum molluscum*, *scorpioides*, *cuspidatum*, &c., in the course of time entirely fills up bogs, drinks up their water, and conduces to their ultimate establishment as component parts of *terra firma*, fit for useful cultivation. In this manner, then, have the originally bare crags of the Malvern Hills received that rich *humus* now covering their sides, and which, combined with the disintegrating touch of Time's mouldering fingers, renders their soil in the present day capable of immediate cultivation even in the steepest places.

On a first cursory glance at the turf of the hills, there seems a great sameness in the mosses that luxuriate there, *Dicranum scoparium* and *undulatum*, *Hypnum triquetrum*, *splendens*, *purum*, and *molluscum*, with the *Polytricha*, seeming as if they had united to exclude the rest, *Hypnum triquetrum* especially everywhere predominating. However, a little attention will show a considerable variety, especially upon or in the immediate vicinity of the rocks, or on the margin of the numerous tinkling rills that show a cincture of the tenderest green wherever they trickle down. The apple-fruited moss (*Bartramia*) has a most

elegant aspect seated among deep crannies of the rocks, and the *Anictangium* quite covers some spots with its grey tresses; while a hoary aspect is given to the loose slabs in the upper ravines, bearded, as they become in decrepitude, with the woolly *Trichostomum lanuginosum*. Some of the mosses, of course, are rare or local; a few, as marked by the letter W., being confined to the limestone on the western side of the range. The following is my enumeration:

<i>Phascum alternifolium</i>	<i>Trichostomum canescens</i>	<i>Polytrichum aloides</i>
crispum	heterostichum	nanum
axillare, W.	aciculare	<i>Funaria hygrometrica</i>
muticum	polyphyllum	<i>Zygodon Mougeotii</i>
cuspidatum	funale	<i>Orthotrichum affine</i>
<i>Sphagnum squarrosum</i>	<i>Dicranum bryoides</i>	cupulatum
acutifolium	adiantoides	anomalum
<i>Gymnostomum</i>	taxifolium	diaphanum
truncatulum	glaucum, E.	striatum
ovatum	cerviculatum	Hutchinsiae?
intermedium	flagellare	crispum
conicum	undulatum	<i>Bryum palustre</i>
fasciculare	crispum	trichodes?
pyriforme	scoparium	crudum
<i>Anictangium ciliatum</i>	heteromallum	argenteum
<i>Encalypta streptocarpa</i>	subulatum, W.	pyriforme
<i>Weissia Starkeana</i>	Starkii	capillare
lanceolata	<i>Tortula rigida</i>	cæspititium
cirrata	convoluta	nutans
curvirostra	revoluta	elongatum
crispula	involuta	ventricosum
controversa	muralis	roseum
<i>Grimmia apocarpa</i>	ruralis	This rare Moss occurs in the little wood behind the Wells Hotel, below Miss Barry's, where I have gathered it in fruit, in which state it is very uncommon. It also grows small and barren on the hill above.
pulvinata	subulata	
tricophylla	unguiculata	
ovata	fallax	
<i>Didymodon purpureus</i>	<i>Cinclidotus</i>	This, which is also rare in fruit, may be so found in the damp western limestone woods.
rigidulus	fontinaloides	
trifarius	<i>Polytrichum piliferum</i>	
capillaceus, R.	undulatum	
flexicaulis, W.	juniperinum	
<i>Trichostomum</i>	commune	
lanuginosum	urnigerum	punctatum

<i>Bryum</i> rostratum	<i>Hypnum</i> riparium	<i>Hypnum</i> rutabulum
In the "Gullet."	undulatum	velutinum
hornum	denticulatum	ruscifolium
Abundantly in fruit in the alder copse close to the Rabbit-warren Farm.	medium	striatum
cuspidatum	tenellum, W.	confertum
	serpens	cuspidatum
<i>Bartramia</i> pomiformis	murale	stellatum, W.
ithyphylla	purum	loreum
fontana	Schreberi	triquetrum
<i>Pterogonium</i> filiforme ?	plumosum	brevirostre
<i>Leucodon</i> sciuiroides	pulchellum	squarrosum
<i>Neckera</i> pumila, W.	sericeum	filicinum
<i>Anomodon</i> viticulosus	salebrosum	palustre
curtipendulum	lutescens	fluitans
<i>Daltonia</i> heteromalla	albicans	aduncum
On the old holly-trees of Hollybush Hill abund- antly, and on Brock- hill.	alopecurum	uncinatum
	dendroides	commutatum
	curvatum	scorpioides
<i>Fontinalis</i> antipyretica	myosuroides	cupressiforme
capillacea ?	splendens	molluscum.
<i>Hypnum</i> complanatum	proliferum	
trichomanoides	prælongum	

*Encalypta streptocarpa*, *Didymodon flexicaulis*, and *Neckera pumila* are only found in the western woods on the limestone strata. The rare *Zygodon Mougeotii* on a wet rock of the Worcestershire Beacon, but always barren. The pretty silvery *Dicranum glaucum* adorns the mole-hills on the green expanse of Welland Common.

### HEPATICÆ—LIVERWORTS.

ANTHOCEROS. *A. punctatus*. Dotted Anthoceros. In moist places about the hills, and in the western woods.

TARGIONA. *T. hypophylla*. Flat-leaved Targiona. Rare. A curious little plant, whose green frond is somewhat similar to Marchantia, and from the under side of which a black globular perianth takes its rise, occupying in maturity the whole of the surface beneath, and then forcing up the frond into nearly, and sometimes quite, a vertical position. The perianth now presents the appearance of a black scull-cap, or helmet with the vizor down, and thus metamorphosed

the dried-up frond is scarcely discernible, acting as a peduncle to it. The raven-black perianth now splits into two concave valves, and numerous light-brown seeds ooze forth, accompanied with woolly filaments, forming a rather dense mass. On very wet rocks of the Worcestershire Beacon, in ravines above the new Wych road.

MARCHANTIA. *M. polymorpha*. Polymorphous Marchantia. In court-yards, shady wet spots, &c.

*M. conica*. Conical Marchantia. Plentiful on the sides of streams about the bases of the hills, but rare in fruit; copiously so on the walls of an old ruined paper-mill by the brook west of Old Storage.

*M. hemisphærica*. Hemispherical Marchantia. Rare. Towards Red Marley, at the southern end of the range.

JUNGERMANNIA. This beautiful little family, exerting their curious capsules only in the most inclement months of the year, and therefore better deserving such a name as BRUMATRADITA (wintry-flourishing) than *Jungermannia*, from an obscure German botanist, occupy the Malvern hills in great luxuriance, if not variety;—*J. Tamarisci*, and the elegant *ciliaris*, particularly abounding. *J. pinguis* is also very common on the sides of the rills; and the rare *J. tomentella* exhibits its curious sponge-like foliage on a dripping rock in the ravine called “The Gullet.” *J. furcata* is of common occurrence, and is occasionally met with in fruit in the deep shades of the Hollybush Hill. *J. ventricosa* is a very characteristic Malvern plant at an early period of the year. This small species is rendered eminently beautiful at that period by the numerous gemmæ aggregated on the tips of the unexpanded leaves, which glitter among the dark mosses that enshroud them, bright as the phosphoric light of numerous minute glow-worms. Hardy as the storm itself, this exquisite Lilliputian vegetation profusely scatters its grains of gold at the dullest season, and on the hill of storms, pressing latent beauty into existence, as the ocean in the darkest night, while furiously breaking on the shore, yet brightens up its lashing waves with phosphoric brilliance. Those only, however, can behold the *Jungermanniæ* in their perfection of beauty who can exclaim with Wordsworth—

“Let the mountain winds be free  
To blow about thee.”

The following list includes all the species I have gathered and examined:—

## JUNGERMANNIA.\*

asplenioides	obtusifolia	Mackaii, f.
inflata, f.	complanata, f.	serpyllifolia, f.
ventricosa, f.	scalaris, f.	dilatata, f.
bicuspidata, f.	viticulosa	Tamarisci, f.
byssacea, f.	Trichomanis	punguis
connivens, f.	bidentata, f.	multifida
incisa	barbata	β. sinuata
pusilla, f.	platyphylla, f.	epiphylla, f.
resupinata, f.	ciliaris	furcata, f.
albicans	tomentella	

## LICHENES—LICHENS.

The Malvern hills are particularly remarkable for the various *Lichens* they produce; so that the late accurate cryptogamic botanist, Mr. Purton, has remarked in his *Midland Flora*, that even in Wales he had scarcely observed any lichens that did not grow upon the Malvern hills. Indeed, he might have stated the converse, for lichens grow here that I have not met with in Wales. Most of them grow in a very luxuriant and beautiful manner, and in the moist autumnal and wintry months many of the rocks present an appearance with their lichens truly gratifying to the lover of nature. Several northern and southern species seem here to attain their respective limitations, for on the same craggy rocks of the North Hill at Great Malvern are found the beautiful golden-hued *Borrera flavicans* and the dingy northern *Parmelia stygia*. Some of the harder granitic rocks are entirely covered with *Umbilicaria pustulata*, which in the spring is of an olive-green colour, and as flabby as a piece of moist leather, though in the summer months it appears black and sooty, as if subjected to the action of fire. On other rocks the deep purple *Parmelia omphalodes* extends itself, contrasted with wide patches of the grey *P. physodes*, the darker *P. saxatilis*, the dusky *P. olivacea*, or the conspicuous glaucous pitted thalli of *Sticta scrobiculata*. On the higher rocks the curled *Cetraria glauca* grows in abundance; while a remarkably hoary aspect is imparted to the protruding masses by the silvery *Isidium coralloides*, and the still more elegant coralline appearance of *Sphærophoron compressum*. The exposed masses of the ridge are many of them curiously dotted with the green adnate fronds of *Lecidea geographica*. The Reindeer lichen, *Cladonia rangiferina*, called by Crabbe

“The wiry moss that whitens all the hill,”

\* f. signifies when found in fruit.



is plentiful on the turf with its allied species, and the sadder and darker *Cornicularia*, as well as the curious dangling Rock Hair, *Alectoria jubata*; while in every part the brown and scarlet apothecia of the *Scyphophori*, in all their multiform varieties, contribute to decorate the scene.

The calcareous rocks of the Silurian system at the base of the Herefordshire Beacon, especially on the side of Chance's Pitch, exhibit some local species not observable on the syenitic rocks, as *Endocarpon Hedwigii*, *Urceolaria calcarea*, *Lecidea rupestris*, *Collema sinuatum*, &c. The Crab's-eye lichen, *Lecanora Parella*, is particularly fine and abundant throughout the chain from north to south, not only on the rocks, but on ash and other trees about the bases of the hills. I have been particularly attentive to the lichens, and in the following catalogue have been as careful as possible to ensure correctness; though in such minute vegetation, often obscure even to a microscopic eye, it is very difficult to discriminate without some error. The *Opegraphæ* of the section *Graphis* are named on the authority of the Rev. W. A. Leighton. One lichen that I have met with appears to be undescribed, and I have thus characterised it: *L. chryso-chlora* (Golden-shielded *Lecanora*). Crust greenish, indeterminate, scattered, apothecia clustered sessile, very small, dull green, with a very thick, inflexed, gold-coloured or light ferruginous border. Scarcely visible to the naked eye but as a number of yellow specks on the exposed rocks; but under a lens very characteristic and peculiar.

The lichens form such a crust or time-tint of colour on the hoary rocks of Malvern, that it is impossible for the most superficial eye not to notice and admire them; and some, as the *Stereocaula*, appear like silver spangles scattered and clustered in the recesses of the rocks; though, when closely examined with a lens, these delicate, glaucous-green, granuliferous lichens appear like minute branching shrubs, beautiful as a mineral efflorescence. Even on the turf the *Scyphophori*, with their brown and bright scarlet apothecia, under the name of *cup-mosses*, are so variable in aspect as to be generally admired and collected, and are often alluded to by the poets of nature, as in the following lines by Mrs. Hemans:—

“ Oh, green is the turf where my brothers play,  
Through the long bright hours of the summer day;  
They find the *red-cup moss* where they climb,  
And they chase the bee o'er the scented thyme.”

<i>Beomyces roseus</i>	<i>Verrucaria rhyponia</i>	<i>Spiloma microscopicum</i>
rufus	gemmata	fuliginosum
<i>Calicium sessile</i>	biformis	punctatum
tympanellum	niveo-atra	gregarium
ferrugineum	rudis	<i>Variolaria Vitiligo</i>
clavellum	aphanes	conspurcata
hyperellum	leucocephala	discoidea
phæocephalum	rupestris	faginea
chlorellum	concinna	aspergilla
curtum	lævata	lactea
debile	viridula	cinerea
sphærocephalum	muralis	multipunctata
furfuraceum	epipolæa	argena
<i>Arthonia impolita</i>	nigrescens	agelæa
Swartziana	epigæa	<i>Urceolaria scruposa</i>
<i>Opegrapha lyncea</i>	<i>Endocarpon</i>	gibbosa
epipasta	miniatum	calcarea
rubella	β. complicatum	contorta*
rufescens	Hedwigii	cinerea ?
atra	pallidum	cyrtaspis
vulgata	fuscillum	<i>Lecidea atrata</i>
varia	<i>Pertusaria</i>	atro-alba
tesserata	communis	verruculosa
elegans	fallax	fusco-atra
scripta	crassa	cechumena
pulverulenta	<i>Thelotrema lepadinum</i>	petræa
serpentina	melaleucum	confluens
<i>Platygramma Lyellii</i>	<i>Lepraria viridis</i>	lapidica
<i>Verrucaria nitida</i>	flava	prominula
cinerea	alba	chalybea
epidermidis	virescens	parasema
analepta	Jolithus	pinicola
punctiformis	nigra	dubia
olivacea	<i>Spiloma nigrum</i>	Griffithii

\* This is what I called *Endocarpon albatu*s in the former edition ; but my friend, the Rev. W. A. Leighton, having microscopically examined it, considers it an *Urceolaria* in a young state, and similar to specimens received from the Rev. T. Salwey, named *U. contorta*. It grows very scattered, not in close patches like *U. calcarea*.

<i>Lecidea aromatica</i>	<i>Lecanora subfusca</i>	<i>Parmelia cycloselis</i>
muscorum	ventosa	virella
geographica	coccinea	stygia
silacea	cerina	aleurites
simplex	crenulata	parietina
immersa	varia	physodes
rivulosa	albella	erosa
pruinosa	Parella (crab's-eye)	<i>Sticta pulmonaria</i>
abietina	tartarea	scrobiculata
speirea	β. Upsaliensis	limbata
albo-atra	vitellina	fuliginosa
epipolia	chryso-chlora, Lees.	<i>Collema nigrum</i>
Lightfootii	<i>Psora scalaris</i>	fragrans
incompta	<i>Squamaria hypnorum</i>	cristatum
quernea	leucolepis	ceranoides
viridescens	candelaria	marginale
pulverea	murorum	nigrescens
incana	Clementi	flaccidum
sulphurea	cæsia	granulatum
expallens	affinis?	crispum
æruginea	circinata	sinuatum
coronata	saxicola	lacerum
anomala	β. pallescens	subtile
effusa	lentigera?	tenuissimum
rupestris	<i>Placodium canescens</i>	Schraderi
irrubata	microphyllum	muscicola
vernalis	plumbeum	<i>Peltidea canina</i>
ferruginea	amplæa, R.	spuria
icmadophila	<i>Parmelia caperata</i>	rufescens
privigna	Borreri	polydactyla
Ehrhartiana	conspersa	<i>Nephroma resupinata</i>
ulmicola	saxatilis	<i>Umbilicaria pustulata</i>
aurantiaca	omphalodes	<i>Cetraria glauca</i>
erythrella	perlata	β. fallax
<i>Lecanora atra</i>	lævigata	<i>Borreria ciliaris</i>
exigua	olivacea	tenella
squamulosa	corrugata	flavicans, R.
sophodes	pulverulenta	<i>Evernia prunastri</i>
tuberculosa	pityrea	<i>Ramalina fraxinea</i>
glaucoma	stellaris	fastigiata

<i>Ramalina scopulorum</i>	<i>Sphærophoron compressum</i>	<i>Scyphophorus alcicornis</i>
farinacea	<i>Stereocaulon</i>	anomæus
pollinaria	botryosum	endivifolius
<i>Usnea florida</i>	nanum	cervicornis
plicata	<i>Cladonia uncialis</i>	pyxidatus
<i>Alectoria jubata</i>	rangiferina	fimbriatus
<i>Cornicularia tristis</i>	pungens	radiatus
aculeata	furcata	cornutus
bicolor?	<i>Scyphophorus</i>	gracilis
lanata?	parasiticus, R.	filiformis
heteromalla	On a rotting stump.	deformis
<i>Isidium coccodes</i>	microphyllus	digitatus
corallinum	On the hill, but very rare.	cocciferus
<i>Sphærophoron coralloides</i>	sparassus	

Besides the above, I have found a species of *Scyphophorus* much resembling *Psora rubiformis*, Hooker, *Lich. rubiformis*, Eng. Bot.; and it appears to me to be very near *S. filiformis*, only that the podetia are sessile. Portions of exposed rock on the hills are in the course of years stained with an inky crust of vegetation, like the morbid sullenness of thought on the mind, that it is almost impossible to make out. Such a production I sent to the Rev. W. A. Leighton, whose skill in microscopical investigation has thrown much light upon the lichenic families; and he informs me that my specimens are identical with Mr. Borrer's *Spiloma tuberculosum*; but he remarks that *Spiloma* is really a fungoid substance.

One of the most beautiful of the Malvern lapideous lichens is *Lecanora coccinea*, whose crimson apothecia, appearing like brilliant rubies, made a splendid show upon the hard granitic rocks. Sir W. J. Hooker says that this appears to be only an old state of *L. Hæmatomma*; but judging from specimens of the latter gathered near Worcester on sandstone, by my observant friend Mr. Abraham Edmunds, of Hammersmith, as well as from specimens preserved by *Bohler* in his *Lichenes Brit.*, I should say that it was very different. The apothecia of *Hæmatomma* are covered and nearly concealed by a mealy border; but those of *L. coccinea* are convex from the beginning, with a narrow border not at all inflex, or in the least degree concealing them.

The beautiful cortical *Thelotrema lepadinum* is only found on old holly-trees on Holly-bush Hill, and in Colwall Copse. *Nephroma resupinata* grows well fruited on a wet rock in a ravine of the Worcester-

shire Beacon. *Cornicularia heteromalla*, which grows only in the interstices of the bark of some old oaks, seems a dubious production. In the winter season, the thalli of several of the foliaceous lichens, such as *Parmelia saxatilis* and *parietina*, are rendered conspicuously beautiful by being dotted over with the little rose-coloured sub-gelatinous fungus, *Illosporium roseum*, Fries.

## ALGÆ.

I. INARTICULATÆ. ULVACEOUS TRIBE. ULVA. *U. crispa*. Crisped green laver. At the base of very damp walls.

*U. calophylla*? Delicate green laver. Forming a fleecy entangled investment of a bright-green colour. On the edge of a bank of gravel under a clump of firs on the Old Hills, near Maddresfield. At the Holy Well, Henwick, Worcester.

*U. bullosa*. Blistered green laver. In pools on Welland Common.

ENTEROMORPHA. *E. intestinalis*. Fronds elongated, inflated, floating. In stagnant pools.

BOTRYDIUM. *B. granulosum*. Consisting of clustered green semi-transparent spherical vesicles on short pedicels, like minute clusters of grapes. On the bed of dried-up pools at Powick.

LEMANIAN TRIBE. LEMANIA. *L. torulosa*. Beaded Lemania. Of a dull olive-green in the water, but dark purple when dried; its moniliform aspect and semi-transparent filaments presenting a beautiful effect against the light. On the stones of the Weir above Powick Bridge, and at Bransford Weir. Dillenius mentions it as occurring near Ludlow, probably also in the river Teme there.

II. CONFERVOIDÆ. CONFERVA. *C. rivularis*. River conferva. In the brook below the Spa Mill, &c.

*C. fracta*. Broken conferva. In pools on Welland Common.

*C. capillaris*. Water flannel. Filaments curled and interwoven into a dense web. On the sides of moist ditches.

## OSCILLATORIÆ.

STIGONEMA. *S. atrovirens*. Black-green Stigonema. Forming broad, rigid, very dark, slender, attenuated filaments, divaricately branched. This is the *Cornicularia pubescens* of Acharius, and externally seems to bear a considerable affinity to that genus of lichens. On the face of a wet rock on the northern side of the Worcestershire Beacon, towards the Sugar-Loaf Hill, where various *Jungermannia* and *Bryæ* grow.



LYNGBYA. *L. muralis*. Wall Lyngbya. "Filaments somewhat rigid, thickish tortuous, interwoven into a bright grass-green stratum." Not uncommon in interstices of the rocks to the summit of the hills. Determined by the Rev. M. J. Berkeley, who had specimens from Mr. G. E. Dennes, Hon. Sec. London Bot. Soc., to whom I sent them. My specimens, however, are all of a *sulphureous* hue, excessively entangled like a piece of old cobweb, and scarcely separable from the rock.

OSCILLATORIA. *O. limosa*. Green mud oscill. Streams on Weland Common.

BYSSOID TRIBE. CHROOLEPUS. *C. aureus*. Golden byssus. The most unobservant eye cannot but notice this golden growth of old Time's beard, fringing many of the rocks in a beautiful manner. Often also it burnishes old crosses with an antique-looking gilding, as at the base of the cross in Colwall churchyard.

*C. barbatus*. Bearded orange byssus. (*Byssus barbatus*, Eng. Bot., *Auzonium auricomum*, Pers.) The filaments of this are much longer than in the preceding, and the colour never fades. The present species, too, seems confined to timber, while *C. aureus* rather affects rocks and stones. I have splendid specimens taken some years since from a beam in an outhouse at Wheatfields, Powick, where it was gathered by my friend Mr. Abraham Edmunds, late of Worcester, well known as an excellent practical entomologist.

*C. ebenea*. Black byssus. On damp rocks, plentiful, especially at the base of the Holly-bush Hill.

PROTONEMA. *P. muscicola*. Chestnut-coloured Protonema. On mosses, crowded in its growth.

III. GLOIOCLADEÆ. NOSTOCH TRIBE. Plants consisting of numerous globules invested with gelatine, and forming globose or filiform fronds.

PALMELLA. *P. cruenta*. Purple Palmella. On damp walls.

*P. botryoides*. Small clustered green Palmella. Fronds densely crowded, globose, green. Consisting of masses of suborbicular green granules irregularly clustered together like some crystallization. On the ground, upon dead mosses.

NOSTOC. *N. commune*. Common nostoc or star-jelly. On the ground after rain.

*N. effusus* (Lees). Green jelly-like nostoc. Encrusting mosses upon the hills in wet weather, like some jelly poured upon them in irregular masses. Of a dark-green colour, but soon drying up, and becoming undistinguishable.

## FUNGI.

The vicinity of the Malvern Hills is an admirable locality for the study of this diversified class, of which nearly four hundred species (without bringing into the account minute mycological productions) have presented themselves to my notice; but at present I only purpose cursorily to mention some of the most obvious and remarkable. The moist grassy declivities of the hills are in autumn peculiarly adapted to the growth of the Agaric tribe, and at that season great quantities appear, and of every conceivable colour, from the vivid scarlet of *Agaricus muscarius* or *puniceus*, the brilliant green and yellow of *A. psittacinus*, and the deep black-blue of *A. chalybeus*, to the dullest brown, assumed by the common fairy-ring *A. oreades*, or the pure ivory-white of *A. virgineus*. Mushrooms are generally very plentiful, though the common kind, *A. campestris*, is much exceeded in numbers and luxuriance by *A. Georgii*; *A. procerus* is also very abundant, and frequently of enormous size. *A. æruginosus*, *granulosus*, *pratensis*, *conicus*, *coccineus*, *epipterygius*, *pyxidatus*, *muralis*, and *geophyllus*, commonly occur. I have gathered the orange Chantarelle (*Cantharellus aurantiacus*), with the cream-coloured variety *lacteus*, nearly at the summit of the Worcestershire Beacon. The short turf, too, is often adorned by different-coloured *Clavariæ*, intermixed with the dark *Geoglossum glabrum* and the pretty *Spathularia flavida*; nor is the curious *Sphæria militaris* very uncommon. *Scleroderma vulgare* abounds on the sides of the walks about the Wells. The brilliant little blood-red *Peziza humosa* is very common amongst dark masses of *Polytricha*; while in moist weather a characteristic feature is presented to view in the great number of "jews' ears," (*Exidia Auricula-Judæ*) hanging upon the countless old Elder-trees that cover the eastern declivity of the Herefordshire Beacon.

Many of the western woods are rich in fungoid productions during the autumnal season, and then make a remarkable show with the large white vase-like pilei of *Agaricus piperatus*, or the clusters of *A. emeticus*, red and blooming as ripe peaches. Several of the edible species are numerous, as the large brown *Boletus edulis*, which is rich as a custard when fried; and the bright orange, apricot-scented Chantarelle (*Cantharellus cibarius*). The *Hydnum*, too, with its bristled under surface, stated by Dr. Badham to be "good as oysters," is not uncommon, as well as various Agarics of piquant flavour. Vegetarian water-patients

might find this Apician diet not unwholesome, and "live in clover" while it lasted.

The pastures at the base of the hills are very much marked with "Fairy-Rings," often of large dimensions :

" The velvet grass seems carpet meet  
For the light fairies' lively feet."

WALTER SCOTT.

Various Agarics form in moist weather a shining broad belt on the borders of these rings ; and besides the common *Agaricus oreades*, I have noticed many composed of the beautiful blue-stemmed Agaric (*A. personatus*), the Mouceron (*A. prunulus*), the Giant Agaric (*A. giganteus*), and *Agaricus grammopodius*.

I will just advert to two good collecting stations for the rarer Fungi, which will suffice to give an idea of what a more extensive range may congregate. The little Beech wood behind the Wells House Hotel, near Miss Barry's mansion, harbours the following other remarkable species :

<i>Agaricus hypothejus</i> , <i>Fries</i> .	<i>Clavaria abietina</i>
— <i>torminosus</i> , <i>Schæff</i> .	— <i>rugosa</i>
— <i>violaceus</i> , <i>Linn</i> .	— <i>cristata</i>
— <i>glaucopus</i> , <i>Schæff</i> .	<i>Helvella crispa</i>
— <i>fastibilis</i> , <i>Pers</i> .	<i>Peziza onotica</i> , <i>Pers</i> . <i>Very rare</i> .
<i>Hydnum repandum</i>	— <i>cochleata</i>
<i>Thelephora coralloides</i>	<i>Phallus impudicus</i>

In the same little wood the rare *Bryum roseum* may always be found, and I have gathered it there in fruit.

Several of the western woods on the calcareous strata nourish rare species, particularly a fir and beech grove in Colwall parish, below Moorall's Well. In these woods may be found—

<i>Agaricus pantherinus</i>	<i>Dædalea quercina</i>
— <i>purus</i>	<i>Hydnum compactum</i>
— <i>ramealis</i>	<i>Thelephora tabacina</i>
— <i>glutinosus</i>	<i>Helvella elastica</i>
— <i>rutilus</i>	<i>Peziza badia</i>
<i>Cantharellus cibarius</i>	— <i>cochleata</i>
— <i>tubæformis</i>	<i>Tremella glandulosa</i>
— <i>cinereus</i>	<i>Nidularia crucibulum</i>
— <i>cornucopioides</i>	<i>Reticularia umbrina</i>

Some Fungi only appear at uncertain intervals, and may not be seen again for years; the most remarkable of these that have occurred to me in this district are the long-stemmed Morell (*Morchella semi-libera*), slimy Leotia (*Leotia lubrica*), and the hygrometric starry puff-ball (*Geaster hygrometricus*). I found the latter at the base of Swin-yard Hill. The rare and beautiful *Agaricus tigrinus* occurred on old willows at Powick.

Of the pretty *Trichia* family, the following occur in the woods, mostly on old stumps :—

*Arcyria punicea*

— *incarnata*

— *cinerea*

— *nutans*

*Trichia pyriformis*

— *fallax*

— *turbinata*

— *chrysosperma* and *Serpula*

But, in fact, a volume would be required adequately to describe the Malvern *Fungi* alone, since almost every ramble is likely to bring additional minute and curious forms to light. I shall therefore close the subject by an appropriate quotation from Dr. Booker's poem on Malvern, where he thus apostrophizes the Holy Well,—but which will equally apply to any of the pure springs upon the hills :—

“ Ever could I stray

Beside thy stream, thou purest spring that flows ;

Climb each bold eminence, and daily find

Some object new for wonder ; ever gaze

On the wide scene around me, and regale,

When thirst demands or pleasing taste invites,

At thy clear rill that sparkles at my foot,

And think it luxury.”

THE END.

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